ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 2015

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRTEENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

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PART 7

DEPARTMENT OF ENERGY

Secretary of Energy

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ENERGY AND WATER DEVELOPMENT, AND RELATED AGENCIES APPROPRIATIONS FOR 2015

WEDNESDAY, APRIL 2, 2014.

SECRETARY OF ENERGY

WITNESS

HON. ERNEST MONIZ, SECRETARY, DEPARTMENT OF ENERGY

Mr. SIMPSON. The hearing will come to order.

Secretary Moniz, it is good to see you again. Welcome to your first hearing before this subcommittee. You have taken over the department at a very challenging time. Your institution is critical for the security of this Nation and it holds great promise for improving the livelihood and prosperity of our economy. It helps answer some of the most basic questions regarding our universe, while it is in charge of cleaning up the radioactive legacy of keeping our country safe during the Cold War and beyond. In other words, there is no doubting the importance of the Department of Energy, yet there is great doubt that the department is up to the task without significant improvements.

One of the subcommittee's most pressing concerns is the department's inability to plan and execute major infrastructure projects. At this point, nearly every major construction project underway over the last 5 years, the MOX plant in South Carolina, the Waste Treatment Plant in Washington state, the Uranium Processing Facility at Y–12, and I could go on, has spectacularly broken its cost projections. And when I say spectacularly, I mean more than doubling, often going billions higher than the plans Congress had agreed to.

Mr. Secretary, another area of concern is the ability of the National Nuclear Security Administration to meet the needs of the Department of Defense. Let me rephrase that. To meet the needs of the Department of Defense in a way clearly communicated to and approved by Congress. It does us no good to have the Department of Energy agree to a work plan with the Department of Defense which we cannot afford. Your department's credibility has been sorely damaged by proposing cost plans which are rapidly exceeded. This is a three-way relationship that is critical to the security of our country, and it needs your personal attention.

I mention these issues because the current state of affairs is not sustainable and this country needs a strong Department of Energy. This subcommittee has long held your nuclear weapons mission to be your ultimate responsibility, but the actions of Russia in the

Ukraine remind us that energy supply can also be an issue of national security. Your department must take that into account as it develops its research and development plans, yet it seems to me as if your fiscal year 2015 budget request misses the mark in that respect.

The two accounts which can help secure the country's energy security today and in the coming years, nuclear energy and fossil energy, are cut while renewable energy is increased. I am not an enemy of renewable energy. Heck, the city of Boise in my district operates the largest direct use geothermal system in the country, but coal and nuclear plants are being shut down across the country. Some of this is because of market forces like the price of natural gas, but some of these closures are also due to government policy.

There is a lot of disagreement up here about the proper role of government, but I think we all agree that the Federal Government's role is to inject strategic thinking into our economy, while markets rarely do that. I can't think of a clearer example of this than our energy supply. If we are going to ensure that our electrical system remains reliable and our country prosperous, then your department needs to be doing more to address our current fleet of power plants, not focus funding far down the road. Your department should be helping to build a power sector prepared to quickly adapt to a time when natural gas prices are no longer cheap and your department should be proposing budgets to support those objectives.

Mr. Secretary, we have had several meetings, and I have been encouraged by our discussions. You have been on the job for, what, 11 months now? Something like that?

Secretary MONIZ. Not quite.

Mr. SIMPSON. Let me give you fair warning for my first question so that you can prepare. I am going to ask you what your vision is for the department, and all of the problems that I have discussed today will have to be fixed as part of achieving any vision, but only a leader with a clear view of what he wants this agency to be will be able to rebuild the department into the strong institution it must be for the security and prosperity of this country.

As I have told you before, one of my challenges that I have had serving on this committee for a number of years is while the Department of Energy does a lot of neat stuff, I have never had a clear vision of where we want to go with this department and why we do some of that neat stuff and how it fits into the overall mission and vision of the Department of Energy.

So as I told you, I think, the last time we had lunch that I would give you all the time you need so that you could paint me a picture of your vision of the Department of Energy over the next 5 years, 10 years, 20 years and where we plan to end up.

Please ensure that the hearing record, questions for the record and any supporting information requested by the subcommittee are delivered in final form to us no later than 4 weeks from the time you receive them.

Members who have additional questions for the record will have until close of business tomorrow to provide them to the subcommittee office.

With that, I will turn to my ranking member, Ms. Kaptur, for her opening statement.

Ms. KAPTUR. Thank you, Mr. Chairman.

And, in the interests of time and competing meetings, I would like to defer, if I could, and turn the gavel—turn the opportunity over to our very esteemed ranking member.

Mr. SIMPSON. I know you'd like to turn the gavel over.

Ms. KAPTUR. Well, we are working on that.

To Congresswoman Nita Lowey of New York.

Mrs. LOWEY. Thank you, Ranking Member Kaptur, and thank you, Chairman Simpson.

And welcome, Secretary Moniz, to your first budget hearing before the House Appropriations Committee. And let me apologize in advance, Chairman Rogers is moving things along very quickly, and there are about three or four hearings every morning, so I apologize.

On Monday, the United Nations Intergovernmental Panel on Climate Change published a new report summarizing the most recent climate science. The report issued ominous warnings about the coming consequences of global warming, which threaten to endanger crop yields, shrink water supplies, flood low lying coastal communities, and even destabilize global security by indirectly increasing the risk of violent conflicts.

As someone whose district was directly impacted by Hurricane Sandy, and who has seen the destruction and cost of global warming up close, there is no doubt in my mind that the United States has a responsibility to support investments to mitigate the domestic impacts of climate change and participate in international efforts to curb emissions to prevent irreversible damage to the planet.

Mr. Secretary, I strongly support prioritization of investments that conform to the President's climate action plan and I applaud you for the $450 million proposed increase for energy efficiency and renewable energy programs. With the damaging effects of climate change clearly visible throughout the country, additional Federal investments to renewable energy research are needed to speed the private sector's development of renewable technologies.

I also share the department's continued commitment to maintaining our country's robust scientific workforce. Equipping our citizenry with the knowledge to capitalize on tomorrow's clean energy economy is one of the best ways to mitigate the impact of global warming.

With the return on investment of 20 to 67 percent from publicly-funded research and development, it is imperative that we continue to invest in innovation at our Nation's colleges, universities and national labs.

Mr. Secretary, I will read your testimony carefully. I apologize that I have to move to another hearing, but I want to do everything I can to ensure that you have adequate resources when the committee writes its fiscal year 2015 bill.

And thank you again, Mr. Chairman and Madam Ranking Member, for your indulgence. Thank you.

Mr. SIMPSON. Thank you. Ms. Kaptur.

Ms. KAPTUR. Thank you, Mr. Chairman.

Let me add my words of welcome to Secretary and Dr. Moniz. We are just really very grateful for your appearance this morning, and really, Mr. Secretary, the early reviews of your tenure as Secretary have been very, very favorable, and I know how hard you are working. I believe that the hardest challenges that we all face on the energy front still lie ahead of us, and you have a very, very important job for our country.

I have long stated that our reliance on foreign energy, is a grave economic and national security concern for our country. Just over the last decade, we have spent over $2.3 trillion, just in the last 10 years, on importing foreign oil. If we go back to the 1970s, which I remember well, that would be even greater. We have made rich some of the worst global players at the expense of our own citizens and we have seen jobs stemmed in our own country because of the lack of energy independence here, we have seen economic growth stifled and, frankly, our national security compromised.

The recent events in the Ukraine, as the chairman has stated, have highlighted in stark relief the importance of reliable energy to our world's ability to defend the borders of sovereign nations. The dependence of Ukraine and much of Europe on Russian energy imports have complicated the international response to Russia's annexation and illegal taking of Crimea. This is not just a challenge to Europe, energy is one of the defining challenges of our time and will only become a greater challenge, not a lesser one.

Since the late 1970s and the formation of your department, progress actually seems glacial. Our own energy crisis is not just about insecure oil supplies from the middle east, but about the cost it inflicts on hardworking Americans, the national security threat it poses to us, and the havoc it wreaks on our environment.

I appreciate your support of an all-of-the-above energy strategy, which I also support, but I would appreciate even more, the Department of Energy setting clearer targets to begin to close these trade gaps and to focus the American people on a long-term strategy that is necessary now, not tomorrow or next week.

While we are developing our approach to energy and its future and our country, we are all in agreement that we must focus on commercialization efforts with a strong bias toward improving American production, American manufacturing, and if we look at our trade deficit, it tells us something really important: the two top categories of trade deficit are in the energy import arena as well as automotive. You link those two, you solve those, you solve the problem that we face on the energy front. I cannot emphasize this point enough, and as I look back after the last 40 years, I say to myself, have we really been serious since the formation of your department?

Our government can drive the policies and incentives for a more robust energy mix and smarter energy consumption, however, as I said before, no matter the policy set forth, if strong leadership and fundamental management reform are not forthcoming at the Department of Energy, it will significantly inhibit the chance of a successful energy policy as well as the department's credibility, and, frankly, the department has had a rather foggy image in the minds of the American people in this regard.

During the questioning period, Mr. Chairman, I will get into contract and project management issues. I have not been a member of this subcommittee as long as our chairman has, but the energy issue is not new to me, and frankly, I have never seen the cost overruns and schedule slips that I now have learned have been endemic at the Department of Energy.

So we look forward to your testimony.

Thank you, Mr. Chairman, for the time, and I look forward to our hearing today.

Mr. SIMPSON. Thank you.

Secretary Moniz, the time is yours.

Secretary MONIZ. Okay. Thank you, Chairman Simpson, Ranking Member Kaptur, and members of the committee.

I appreciate the opportunity to appear before you today, as was said, for my first budget presentation before the Congress.

The President has made clear the Department of Energy has significant responsibilities, as you have acknowledged in your opening statements, both for advancing the Nation's security, and I would say especially by maintaining a reliable nuclear deterrent and by helping to keep nuclear materials out of the hands of terrorists, and the Nation's prosperity, and especially by advancing his all-of-the-above approach to clean energy, and by helping to provide the foundation for the future manufacturing capabilities that we need.

So as you know, the top line discretionary budget request for fiscal year 2015, is $27.9 billion, a 2.6 percent increase above fiscal year 2014. I believe that increase in these constrained budget times reflects the high priority assigned to these missions.

So I will just say very briefly a few things about the budget request so that we can move on to our discussion. I will organize it around each of the three programmatic areas which have been set up through our reorganization at the undersecretary level, focusing on three key areas: science and energy; nuclear security; and management and performance, and I believe all three of these have featured in your opening statements.

On science and energy, first, the all-of-the-above energy strategy, is driving economic growth and creating jobs while lowering carbon emissions. We are producing, as you well know, more natural gas in the United States than ever before, we are increasing oil production and, in fact, for the first time in 2 decades, we are producing more oil than we import, at the same time, in that same period, having the lowest CO_2 emissions that we have had.

We have seen remarkable progress in clean and renewable energy. The last 5 years more than doubled electricity from wind and solar, while still making the investments in coal and nuclear power that I believe are needed for those sources to be competitive in a clean energy economy, and efficiency, as was noted, is a major focus of our fiscal year 2015 budget request. There is a $9.8 billion request in this area, an increase of 5 percent for science and energy programs to advance these areas.

Just a few examples of EERE, Energy Efficiency and Renewable Energy. Here we have a substantial proposed increase to support investments in areas of sustainable transportation, renewables, efficiency and advanced manufacturing. Those are highlighted in the budget request. The Office of Electricity Delivery and Energy Reli-

ability program, more precisely, is our lead office in driving a focus on grid modernization and resiliency, again, themes that you have referred to in the opening statements.

There is a substantial increase proposed to support grid modernization and resiliency efforts, including smart grids and micro grids, energy storage, and a strengthened energy response capability. Ranking Member Lowey mentioned Hurricane Sandy, and we know the importance of that response. These programs on grid modernization will be carried out in collaboration with EERE, Energy Policy and Systems Analysis and other offices at the department.

ARPA-E, the Advanced Research Projects Agency-Energy, this program, we believe, is being extremely effective. Actually there are 24 startup companies already out of the ARPA-E funding. We request a 16 percent funding increase for ARPA-E to support four or five new focussed programs, but also to have our third open funding competition to bring new ideas across all of the energy space.

The budget request also includes funding for the Office of Energy Policy and Systems Analysis. I would like to highlight this was part of our reorganization to provide a focus for, particularly, analysis that underpins energy policy development, and they play a central role in the administration-wide Quadrennial Energy Review.

Turning to the Science programs, as you know, DOE Office of Science provides critical, scientific and technical underpinnings for all departmental missions and for the entire country's physical science and engineering research capacity. We request $5.1 billion for the Office of Science.

As one example, Science, in conjunction with NNSA, again, a theme I like to emphasize, we are coordinating across programs, will focus on developing Exascale computing platforms, and we believe the road to Exascale will have many, many novel technology developments, that will continue our traditional and critical American leadership in high performance computing for both economic competitiveness and national security.

The budget also supports the Office of Science's unique role in a whole range of cutting-edge user facilities, a very, very important service that we support for the American research community, and that ranges from a set of highly efficient, highly effective light sources, the Spallation Neutron Source; a new project, the Facility for Rare Isotope Beams; and many other projects.

As I already noted, grid modernization and Exascale are two examples of our focus on cross-cutting initiatives, coordinating the efforts in multiple offices on important problems. Another example is subsurface science and engineering, where we will bring together efforts in about four offices, because in the past we haven't really put together the way subsurface science and engineering cuts across multiple energy programs, from unconventional resources to geothermal, to waste management and other activities.

Nuclear security. Again, a few words. Just over a week ago, I was in the Hague with the President, where he reiterated his commitment to nuclear non-proliferation and security, calling on the global community to decrease the number of nuclear weapons, con-

trol and eliminate nuclear weapon useable material, and build a sustainable and secure nuclear energy industry, all central to our mission.

I might add, we had a specific announcement, which was a major announcement with Japan, in terms of bringing hundreds of kilograms of highly enriched uranium and plutonium for safe handling in the United States. The budget request provides $11.9 billion for our nuclear security missions, a 4 percent increase.

Budget caps, as you know, and I might say, Mr. Frelinghuysen knows well, have put serious constraints on our national security enterprise broadly. We had a robust interagency planning process relooking at our stockpile strategy.

Mr. Chairman, you mentioned the constraints in budgets, we put forward, we think, a strong request there, with the commitment to maintain the so-called, three-plus-two deterrence strategy that was agreed to, but has been challenged since the Budget Control Act, and we believe we do have now, an affordable strategy to complete the three-plus-two approach to a safe and reliable stockpile without testing, while reducing the numbers and types of weapons in the next two decades.

Defense nuclear non-proliferation, as I already alluded to, is another obviously very high nuclear security priority, and we do support a very robust program, but clearly our budget, because of the constraints, we came in with a substantial reduction in funding for this program, more than half of that reduction due to reduced funding for the mixed oxide fuel fabrication facility, and this was driven by something, again, you have both referred to. We simply have to get hold of the costs of these majors projects, and so we have proposed a standby mode to analyze all available options, including MOX, to reach an agreed upon way to dispose of this weapons plutonium.

Naval reactors, again, I would say a strong request to support the Navy's fleet of aircraft carriers and submarines. Nuclear propulsion is obviously central to our defense capabilities, and the interagency working group assigned high priority to initiatives, such as continuing the work on the Ohio class submarine replacement and spent fuel handling recapitalization.

And finally the third area is a new one that we created through reorganization, that of the undersecretary for management and performance. The fiscal year 2015 budget request would provide $6-and-a-half billion for management and performance programs underneath the undersecretary, but also with the direct management programs that report to the office of the secretary.

Importantly, the budget request reflects our move of the responsibility for environmental management program from the undersecretary for nuclear security, and I emphasize not NNSA, but the undersecretary, into a mainline responsibility for the management and performance undersecretary, to improve departmental management and execution of several technically complex cleanup missions.

The budget request continued to support cleanup progress at 16 sites across the complex, and we should remember that many projects have been successfully completed. What remains are not

surprisingly, the most complex and unique ones that we need to address.

By the way, and I am pleased to add kind of a news bulletin, that despite the incident at WIPP, the first shipment of transuranic waste from Los Alamos to WCS in Texas arrived early this morning for storage until WIPP re-opens. And the bigger message here is that while we are continuing to work to investigate the issues and remediate the issues at WIPP to reopen it, we are continuing to move forward with movement and packaging of true waste.

In conclusion, we believe the fiscal year 2015 budget request will allow us to deliver innovative and transformative scientific and technological solutions to energy, security, economic and environmental challenges facing our country in this century.

I took note of the 4 weeks for response. We will meet that. And thank you, and I am pleased to answer your questions.

[The information follows:]

Testimony of Secretary Ernest Moniz
U.S. Department of Energy
Before the
House Committee on Appropriations
Subcommittee on Energy and Water Development and Related Agencies
April 2, 2014

Chairmen Rogers and Simpson, Ranking Members Lowey and Kaptur, and Members of the Committee, thank you for the opportunity to appear before you today to discuss the Department of Energy's (DOE) Budget Request for fiscal year (FY) 2015. This is my first time appearing before this Committee since I joined the Department of Energy last May, and I appreciate the opportunity to discuss how the budget request advances our clean energy, science, nuclear security, and nuclear waste cleanup goals to carry out the President's priorities.

The President has made clear that the Department of Energy has significant responsibilities for advancing the nation's prosperity and security through its mission. In particular, I would like to highlight three critical mission areas of the Department.

As the President said in the State of the Union address, "the all-of-the-above energy strategy I announced a few years ago is working, and today, America is closer to energy independence than we've been in decades." This strategy is driving economic growth and creating jobs, while lowering our carbon emissions. We are producing more natural gas in the United States than ever before. And for the first time in twenty years, we are producing more oil at home than we import from the rest of the world. We have also made remarkable progress in clean and renewable energy. In the last five years, we have more than doubled the amount of electricity we generate from wind and solar. At the same time, we are making the investments that will enable coal and nuclear power to be competitive in a clean energy economy, and aggressively advancing efficiency for its economic and environmental benefits.

In June 2013, the President launched the Climate Action Plan. Under this plan, the Department is working to reduce the serious threat of climate change and, with a

heightened focus on resilience, preparing American communities for the impacts of a changing climate that are already being felt.

Just over a week ago at the Nuclear Security Summit in The Hague, the President reiterated his commitment to nuclear nonproliferation and security, calling on the global community to decrease the number of nuclear weapons, control and eliminate nuclear weapon-usable materials, and build a sustainable and secure nuclear energy industry. All of these areas are central to the Department of Energy's mission: maintaining a strong and credible strategic deterrent, working to secure and eliminate vulnerable nuclear materials around the world, and advancing safe nuclear power technology for the decades ahead.

Both of these mission areas – clean energy and nuclear security – depend on sustaining America's research and development (R&D) leadership. The Department of Energy, to a large extent through our seventeen national laboratories, plays a key role in our nation's respective advantage in the physical sciences.

Finally, the President's Management Agenda includes an emphasis on Federal agencies' effective and efficient execution of their missions for the American people.

Carrying Out DOE's Top Priorities through an Effective Organization

The Department of Energy's budget request for fiscal year (FY) 2015 aligns the agency's funding and organization with these three presidential priorities.

First, while the Department's science and energy programs have previously been managed and overseen separately by two under secretariats, we have merged those roles into a single Under Secretary for Science and Energy to more effectively carry forth our science and energy priorities. I'll discuss some of the cross-cutting initiatives facilitated by this new organizational structure, as well as how we are reexamining and strengthening the way we work with our National Laboratories to better carry out our science and energy missions.

Next, an Under Secretary for Nuclear Security, who also serves as Administrator for the National Nuclear Security Administration, oversees our nuclear security missions and ensures effective and efficient collaboration across under secretariats on crosscutting activities and missions. This Under Secretary is also engaging in discussions with the National Laboratories and with Congress to ensure that all of our sites are working to serve the public interest to the greatest extent possible. This position is, of course, established with the principle high level charge of preserving U.S. nuclear security, this why we are moving the Office of Environmental Management to the new Undersecretary for Management and Performance.

Finally, we created the Under Secretary for Management and Performance to implement a strong focus on management to effectively carry out our missions on behalf of the American people. It is not a secret that DOE has room for improvement in this area, and establishing this new position will bring focus and leadership to these challenges.

This Under Secretary focuses on management across the Department, and oversees our environmental cleanup programs. It is inherently complex and challenging to design and implement one-of-a-kind projects to nuclear safety standards. We have had many successes in implementing major projects at the Department of Energy, and obviously we have had and are continuing to have major challenges. We have reduced our Cold War legacy "footprint" by 74 percent. But of course, the most complex and difficult projects remain. A focus on management and performance is critical to further building upon our successes and overcoming our challenges.

The Department of Energy's top-line discretionary budget request for FY 2015 is $27.9 billion, a 2.6 percent increase above FY 2014. The Department of Energy's 2.6 percent increase recognizes our high-priority missions for clean energy and addressing climate change, nuclear security, and innovation. The Department of Energy's budget request includes $9.8 billion for energy, science, and related programs, $11.9 billion for nuclear security, and $6.5 billion for management and performance and related programs. I will discuss the budget request for each of these three programmatic areas in more detail.

Recognizing the importance of the two-year budget agreement Congress reached in December, the Budget adheres to the 2013 Bipartisan Budget Act's discretionary funding levels for 2015. However, these levels are not sufficient to expand opportunity to all Americans or to drive the growth our economy needs, and the need for pro-growth investments in infrastructure, education, and innovation has only increased due to the Great Recession and its aftermath. For that reason, the Budget also includes a separate, fully paid for $56 billion Opportunity, Growth, and Security Initiative (OGSI), which shows how additional discretionary investments in 2015 can spur economic progress, promote opportunity, and strengthen national security. Consequently, in addition to the base budget submission of $27.9 billion for the Department of Energy, OGSI provides $1.6 billion for additional investments at the Department of Energy. Those investments consist of over a billion dollars in the energy and climate arena—including $355 million for climate resilience and $684 million for clean energy and energy efficiency activities—and $600 million for additional investments in nuclear security.

In addition to our discretionary budget and OGSI, the Budget also proposes an Energy Security Trust. This $2 billion investment over 10 years will support R&D into a range of cost-effective technologies – like advanced vehicles that run on electricity, homegrown biofuels, renewable hydrogen, and domestically produced natural gas – and will be drawn from existing royalty revenues generated from Federal oil and gas development.

Science and Energy

The budget request includes $9.8 billion for science and energy programs to further our all-of-the-above energy strategy, support the President's Climate Action Plan, continue the Quadrennial Energy Review, and maintain global scientific leadership. The request includes $4.7 billion for a portfolio of energy activities consisting of our applied energy programs, the Advanced Research Projects Agency—Energy (ARPA-E), the Loan Programs, International Affairs, the Energy Information Administration, our new Energy Policy and Systems Analysis program, our proposed consolidation of the Office of Indian Energy Policy and Programs, and the Power Marketing Administrations. These offices reflect the

wide diversity of programs, roles, and responsibilities that we have in the Nation's energy sector.

The budget request for science and energy also includes $5.1 billion for the Office of Science, which provides the national research community with unique research opportunities at major facilities for nuclear and particle physics, energy science, materials research and discovery, large-scale computation, and other disciplines.

Together, these programs support the President's Climate Action Plan, further an all-of-the-above energy strategy, and promote and sustain U.S. leadership in science and technology innovation to ensure that clean energy technologies are invented and manufactured here in America.

Energy Efficiency and Renewable Energy

The Department's Office of Energy Efficiency and Renewable Energy (EERE) is the U.S. Government's primary clean energy technology organization, working with many of America's best innovators and businesses to support high-impact applied research, development, demonstration, and deployment (RDD&D) activities in the areas of sustainable transportation, renewable power, and energy efficiency.

EERE has experienced tremendous success in contributing to efforts to reduce U.S. dependence on foreign oil, save American families and businesses money, and grow the domestic clean energy industry. For example, EERE has helped manufacturers increase their energy productivity, including providing technical support to 590 combined heat and power projects between FY 2009 and FY 2013. Since 1979, EERE-supported RD&D has advanced 220 new manufacturing technologies that can and will continue to significantly increase energy efficiency. In addition, through the EERE-supported SuperTruck Initiative, EERE partners have developed a full-scale, prototype class 8 heavy-duty truck that is 61% more efficient than current technology. And these are only a couple of examples of the work underway.

The budget request for EERE is $2.3 billion, a 22 percent increase over the FY 2014 enacted level to fully support investments in these areas of sustainable transportation, renewables, and efficiency and manufacturing.

From day one as Secretary, I have placed a strong emphasis on energy efficiency. This budget follows through on that focus by proposing a 39 percent increase in energy efficiency programs in building efficiency, weatherization of homes, advanced manufacturing, and Federal energy and State and local partnership activities. This increase includes funding for activities, such as developing and issuing new appliance standards and working with States on building code development, to strongly promote energy efficiency in support of our goals for the climate, the economy, and American competitiveness.

In his State of the Union address, the President articulated his vision for supporting American manufacturing, including a focus on increasing the number of our manufacturing institutes to accelerate U.S. development of world-leading manufacturing technologies and capabilities. These Institutes connect businesses to research universities that can help America lead the world in advanced technologies. In addition to DOE's contribution to the first institute on additive manufacturing led by the Department of Defense, the Department of Energy awarded an additional institute this year that specializes in wide bandgap semiconductors and announced a competitive solicitation for an additional institute on advanced composites. The FY 2015 budget request will support at least one additional manufacturing institute funded at up to $70 million over five years, with at least one-to-one matching funds from the recipient.

Vehicle technologies are a major focus of DOE's EERE budget request and of the Energy Security Trust proposal. The FY 2015 budget request supports research, development, demonstration, and deployment of efficient and alternative fuel vehicles, including the EV Everywhere goal that aims to make electric vehicles as affordable and convenient as the gasoline powered vehicles we drive today by 2022. This would be accomplished through cost reduction and improved performance in batteries, electric drive systems, lightweight materials, and integration with the electric power grid. The request also includes funding to continue a focused research and development effort to reduce the cost and increase

the durability of fuel cell systems. The request further includes $60 million, administered through authority provided by the Defense Production Act, in collaboration with the Departments of Agriculture and Defense, to continue to enable the objective of producing advanced biofuels that meet military specifications at a price competitive with petroleum—an initiative first supported with DOE funding in FY 2014.

The Department's budget request also continues to advance renewable energy through a number of ongoing initiatives. The request supports the SunShot Initiative's mission to make solar energy technologies, including both solar photovoltaic (PV) and CSP technologies, cost-competitive with traditional sources of electricity, without subsidies, by 2020. It supports research, development and demonstration for wind energy, including funds for three advanced offshore wind demonstration projects to be operational by 2017, and it includes funding to advance technologies in both conventional hydropower and marine and hydrokinetic devices. The request continues to support the Frontier Observatory for Research in Geothermal Energy (FORGE), a new geothermal energy R&D project started in FY 2014, and a critical step for learning how to harness our vast but untapped domestic geothermal resources through enhanced geothermal systems.

Fossil Energy

As part of our all-of-the-above energy strategy, DOE's Fossil Energy Research and Development program advances technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels which are essential to our Nation's security and economic prosperity. Since President Obama took office, the Department of Energy has invested more than $6 billion in carbon-capture and storage (CCS) research, development and demonstration. The Office of Fossil Energy is leading this charge, supporting critical research and deployment efforts to ensure that all sources of energy, including fossil fuels, are competitive in a carbon constrained economy.

The budget request continues the Department's strong focus on carbon-capture and storage (CCS) through its $476 million request for Fossil Energy (FE) Research and Development. In addition to our current portfolio of demonstration projects,

The request includes $25 million for a new demonstration program, Natural Gas Carbon Capture and Storage (NG-CCS), to support a project to capture and store carbon emissions from natural gas power systems. Looking into the future, CCS technologies will be required for natural gas, as with coal, to be a major player in a low-carbon world.

In addition, the Loan Guarantee Program is currently receiving applications for up to $8 billion in loan guarantees focused on advanced fossil energy projects that reduce CO_2 emissions. Together with these ongoing projects and the fossil loans, the FY 2015 budget request constitutes a major fossil energy program.

The request includes $15.3 million to implement priority collaborative research and development with the Environmental Protection Agency and Department of the Interior to ensure that shale gas development is conducted in a manner that is environmentally sound and protective of human health and safety; $4.7 million to fund a new midstream natural gas infrastructure program focused on advanced cost-effective technologies to detect and mitigate methane emissions from natural gas transmission, distribution, and storage facilities and to communicate results on methane emissions mitigation to stakeholders; and, $15 million to conduct lab- and field-based research focused on increasing public understanding of methane dynamics in gas-hydrates bearing areas.

The budget request provides for the full operational readiness of the Strategic Petroleum Reserve including restoration of its designed drawdown capability.

Nuclear Energy

The Office of Nuclear Energy works to advance nuclear power as a resource capable of contributing to meeting the Nation's energy supply, environmental, and national security needs. The budget request for the Office of Nuclear Energy, $863.4 million, is roughly flat compared to the FY 2014 appropriated level. The Office will continue ongoing work with particular focus in two main areas: the development of next-generation nuclear reactors and the management of nuclear waste.

For next-generation reactors, the budget request continues to fund research and development on advanced reactor technologies, as well as technical support for two awards to help accelerate the commercialization of small modular reactors. It also provides funding for the continuation of the Department's first Energy Innovation Hub into a final five year term, assuming the determination is made that the Hub meets all requirements and criteria to be eligible for renewal. The Department is using a formal process make the renewal determination, which will be completed within FY 2014. This hub is focused on nuclear energy modeling and simulation and currently centered at Oak Ridge National Laboratory.

In addition to the focus on new reactor technologies, the budget request funds for activities to advance the Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*. The budget request continues to lay the groundwork for implementation within existing authorities by providing $79 million for Used Fuel Disposition activities, including $30 million for generic process development and other activities related to storage, transportation, disposal, and consent-based siting, and $49 million for related generic research and development. The budget also includes a funding reform proposal needed to support implementation of the nuclear waste management program over the long term.

Electricity Delivery and Energy Reliability

The Electricity Delivery and Energy Reliability (OE) program drives electric grid modernization and resiliency in the energy infrastructure through research and development, partnerships, facilitation, modeling and analytics, and emergency preparedness and response. OE also serves as the Federal government's primary liaison to the energy sector in responding to energy security emergencies, both physical and cyber.

OE's development of advanced sensors to measure the flow of electricity in real time is enabling grid operators to monitor system health and mitigate disturbances. Roughly 1700 sensors have now been installed nation-wide, providing wide visibility of the grid that can prevent the kind of cascading events that caused the 2003 blackout. OE's cybersecurity research has produced commercially available

tools designed specifically for the energy sector. Just one example is a tool to assist the electricity sector assess and strengthen their cybersecurity maturity posture. This program has been accessed by over 100 utilities and has now been adapted and released for use by the oil and natural gas sector. OE also responded to three energy emergency events in FY 2013, including Superstorm Sandy, facilitating restoration efforts through trained analysts and responders coupled with the deployment of the program's near-real time visualization capability, enabling quicker power restoration and fuel delivery systems.

The budget request, $180 million, includes a substantial increase for OE, over 20 percent, to emphasize grid modernization and resiliency in several areas. The budget increase supports the Department's growing focus on increasing the resiliency of the energy infrastructure through emergency preparedness and response. From the severe cold weather over the past winter to extreme storms, including Superstorm Sandy, we have seen how important these activities are. The Department is also focused on the growing danger of cyber-attacks and the physical security of the grid. The budget increases funding to strengthen the energy infrastructure, critical for national, economic and energy security, against both natural and man-made hazards, through research and development and through the establishment of an Energy Resilience and Operations Center.

The budget increase also helps move the Nation closer not only to a more resilient grid, but one that is also more reliable, efficient and flexible through research and development into microgrids and grid-scale energy storage. It also invests in transformation of the distribution system toward higher performance through new, more advanced control systems.

Advanced Research Projects Agency—Energy

The Advanced Research Projects Agency—Energy (ARPA-E) program takes a unique entrepreneurial approach, supporting high-risk high-reward energy technology research projects that could create the foundation for entirely new industries, but are too early in their development for private sector investment. With ARPA-E, we are swinging from the heels and trying to hit home runs, not just base hits.

ARPA-E has invested over $900 million across 363 projects through 18 focused programs and two open funding solicitations. In the past year alone, ARPA-E has launched focused programs to improve techniques to manufacture light-weight metals, develop robust battery chemistries and architectures for electric vehicles, biologically convert natural gas to liquids, create innovative semiconductor materials for improved power conversion, and use solar concentration techniques for hybrid solar converters. To date, 22 ARPA-E projects have attracted more than $625 million in private-sector follow-on funding after ARPA-E's investment of approximately $95 million.

ARPA-E funded companies and research teams have successfully engineered microbes that use carbon dioxide and hydrogen to make a fuel precursor for cars, developed a one megawatt silicon carbide transistor the size of a fingernail, produced a new hardware device that regulates the flow of power on the electrical grid and software that allocates electricity in much the same way internet routers allocate bandwidth throughout the internet.

The budget request provides $325 million for ARPA-E, a 16 percent increase, which will be split between an open solicitation to capture potentially transformational ideas not within the scope of existing programs, as well as 4-5 new programs looking at critical energy challenges.

Loan Programs

The Department's Loan Programs Office supports a large, diverse portfolio of more than $30 billion in loans, loan guarantees, and commitments, supporting more than 30 closed and committed projects. The projects that LPO has supported include one of the world's largest wind farms; several of the world's largest solar generation and thermal energy storage systems; the first new nuclear reactors to begin construction in the U.S. in more than three decades; and more than a dozen new or retooled auto manufacturing plants across the country. The program as a whole is performing very well to date, with losses below expected levels.

The example of utility scale solar shows how the Loan Program can jumpstart an entire industry. If we think back to 2009, photovoltaic projects larger than 100 MW were non-existent in the United States. And there was no commercial financing market for large solar projects. Using Recovery Act Funds, our Loan Program Office financed the first six utility scale PV projects in the United States. And these projects helped prove to private industry that the technology was viable and cost effective. Since our initial investments, ten new utility scale projects have been funded by the private sector.

The budget request includes administrative funds for the Title 17 Innovative Technology Loan Guarantee Program and the Advanced Technology Vehicles Manufacturing Loan Program. While the budget does not propose new loan authority or credit subsidies, I would note that the Loan Program celebrated a number of milestones in the last few months, including the opening of the Ivanpah solar plant—the world's largest solar-thermal plant—and the financial closing of two loan guarantees to support the construction of the Vogtle nuclear reactor project. We have also begun accepting applications for an $8 billion advanced fossil energy loan guarantee solicitation, and we look forward to continue to use the Program's existing authority to support the President's all-of-the-above energy strategy.

Energy Information Administration

The Energy Information Administration (EIA) is the statistical and analytical agency in the Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. In the last year, EIA released a new Drilling Productivity tool, which has already received widespread, praised from industry participants and will also lead to a more accurate baseline for production estimates in many other of EIA's reports. In 2013, EIA also launched the most comprehensive portal of the U.S. government's national and state energy data currently available.

EIA is important both to the mission of the Department and also to the functioning of energy markets. The budget request proposes $122.5 million, an increase of 5 percent, to fully support EIA's important capabilities through upgrades to its infrastructure and the development of the new products for evolving energy markets.

Energy Policy and Systems Analysis

The Office of Energy Policy and Systems Analysis (EPSA), established last year, serves as my principal policy advisor on energy and related integration of energy systems and acts as a focal point for the Department's analysis and development of energy policy that could facilitate the transition to a clean and secure energy economy. EPSA carries out strategic studies and policy analysis, maintains and coordinates a supporting set of analytical capabilities, and carries out assessments of the strength, resiliency, and anticipated challenges of national energy systems.

By identifying and prioritizing ways in which DOE programs may be strengthened to contribute to the economic well-being, environmental quality, and energy security of the United States, EPSA plays a critical role in the Department's policy formulation, and in efforts like the Quadrennial Energy Review (QER) and DOE's crosscutting grid modernization initiative.

The QER report will provide an integrated view of, and recommendations for, Federal energy policy in the context of economic, environmental, occupational, security, and health and safety priorities, with attention in the first report given to the challenges facing the Nation's energy infrastructures. It will review the adequacy, with respect to energy policy, of existing executive and legislative actions, and recommend additional executive and legislative actions as appropriate; assess and recommend priorities for research, development, and demonstration programs to support key energy-innovation goals; and identify analytical tools and data needed to support further policy development and implementation.

The budget request for EPSA is $38.5 million, an increase of $22.4 million, to support several key initiatives. The increase primarily funds the crosscutting grid

modernization efforts, as well as analytics and modeling in support of DOE's responsibility as secretariat for the government-wide Quadrennial Energy Review.

Indian Energy Policy and Programs

The Office of Indian Energy Policy and Programs (IE) directs, fosters, coordinates, and implements energy planning, education, management, and competitive grant programs to assist Tribes with clean energy development and infrastructure, capacity building, energy costs, and electrification of Indian lands and homes. IE performs these functions consistent with the federal government's trust responsibility, Tribal self-determination policy, and government-to-government relationship with Indian Tribes, and accomplishes its mission through technical assistance, education, and capacity building; research and analysis; and financial assistance to Indian Tribes, Alaska Native Tribes and corporations, and Tribal energy resource development organizations.

The budget request, which provides $16 million for Indian Energy Policy and Programs as a separate appropriation, reflects the consolidation of our tribal energy programs into a single office.

Science

DOE's science programs provide the technical underpinnings to accomplish the Department's missions and form part of the backbone of basic research in the physical sciences in the United States. Almost 28,000 researchers use Office of Science user facilities each year, and the successful construction and operation of these facilities is central to the economic competitiveness, national security, and scientific leadership of the Nation.

The budget request provides $5.1 billion for the Office of Science, a 1 percent increase above FY 2014. The request builds upon the Department's strength in the development of large-scale computational capability. The FY 2015 request supports the Office of Science in developing next-generation computational tools—and in applying these tools to many of science's grand challenges, such as climate modeling and computational material science.

In particular, Science will lead, in conjunction with NNSA, research focused on developing capable exascale computing platforms. Maintaining a strong program in high performance computing will be tremendously important to our economic competiveness and national security, and government-wide coordination of this effort will ensure that the U.S remains a global leader in high-performance computing for science, defense and industry.

The budget request also supports our ongoing commitment to leading-edge scientific facilities. The request ramps up construction of the Facility for Rare Isotope Beams at Michigan State University, which was dedicated on March 17th. The request also continues construction of the Linac Coherent Light Source II—another example of the many cutting-edge DOE facilities that provide an unparalleled set of research tools to tens of thousands of science users.

In FY 2015, we sustain our commitment to our highly productive Energy Frontier Research Centers and three Bioenergy Research Centers. The budget request also includes funding for the Office of Science's two Energy Innovation Hubs, which focus on batteries and converting sunlight to liquid fuels. I would also note that I have charged the Secretary of Energy Advisory Board to look at how we can evaluate and continue to improve the performance of the Department's Hub model moving forward. The Advisory Board's draft report was released late last month, and I would be happy to discuss its findings once the report is finalized.

Crosscutting Initiatives

Finally, we have identified a number of areas for crosscutting initiatives to tackle common challenges and recognize shared opportunities across multiple DOE offices. I have selected these initiatives because of their potential to be game-changers in energy and security, to add value through collaboration and leveraging DOE's full breadth of research and technologies, and to ensure there is no duplication of effort. These collaborative efforts extend across DOE's programs and National Labs and are designed to leverage the unique, first-class array of facilities and capabilities that exist across the DOE complex.

The grid modernization initiative implements a unified strategy to address institutional and technological challenges to creating a more secure, resilient, and flexible future grid. The initiative enlists the unique strengths and focuses of four offices: OE, EERE, EPSA, and the Office of Congressional and Intergovernmental Affairs.

The subsurface environment is critical to the U.S. for energy production, energy and CO2 storage, remediation of existing legacy waste, and ultimate disposal of future energy wastes. With the subsurface crosscutting initiative, DOE is bringing together its Science, Fossil Energy, Environmental Management, Energy Efficiency and Renewable Energy, and Nuclear Energy programs into a coherent, coordinated approach to common challenges in characterizing, engineering, monitoring, and controlling subsurface systems in various geologic environments.

The exascale computing initiative continues research and development with our Office of Science and NNSA leading to the implementation of advanced computing systems that will be tremendously productive for science, defense, and our Nation's innovation leadership. An approach coordinated across DOE Offices as well as across the government will help to accelerate that effort. The Department of Energy is part of an interagency effort to optimize investments to sustain our nation's leadership in high performance computing to the benefit of our research capacity, our nuclear security and our industrial base.

Supercritical carbon dioxide (SCO_2) power systems have broad potential for substantially lower-cost, higher-efficiency energy in a number of energy areas. The supercritical CO_2 crosscutting initiative continues related work in renewable energy and fossil energy, and fully-funds a new 10-megawatt supercritical CO_2 technology electric power (STEP) demonstration project in the Office of Nuclear Energy.

Finally, the cybersecurity crosscutting initiative funds activities in four offices—NNSA, OE, Science, and the Chief Information Officer—to strengthen the protection of DOE from cyber-attacks, bolster the Nation's capabilities to address cyber threats, and improve the cybersecurity of the energy sector.

Nuclear Security

The budget request provides $11.9 billion for our nuclear security missions, a 4 percent increase over FY 2014, in support of national security priorities articulated in the 2010 Nuclear Posture Review, the Stockpile Stewardship and Management Plan, and the 2010 National Security Strategy of the United States, to secure nuclear materials globally, and to ensure protection of DOE's national security assets.

Weapons Activities

The Department of Energy is responsible for certifying a safe and reliable stockpile without testing, as long as we have nuclear weapons. While budget caps have put difficult constraints on the nation's national security enterprise, the interagency planning process—involving the Department of Defense, Department of Energy, National Security Council, and the Office of Management and Budget—created a revised strategy and budget request that remains committed to the "3+2 strategy" to maintain a safe and reliable stockpile while reducing the numbers and types of weapons in the next two decades.

The FY 2015 budget request for Weapons Activities is $8.3 billion, a $534 million or a 7 percent increase over FY 2014, to maintain a safe, secure, and effective nuclear stockpile, and to strengthen key science, technology, and engineering capabilities and modernize the national security infrastructure. The budget request supports the revised strategy to achieve the B61-12 LEP First Production Unit (FPU) by FY 2020 and complete production of the W76-1 warhead by FY 2019. The strategy defers the W78/88-1 Life Extension Program by five years, achieves the W88 ALT 370 FPU in the first quarter of FY 2020, and delays the Long-range Standoff warhead by three years to 2027, while evaluating the option for a future budget request. Under the strategy, the budget continues engineering design for the Uranium Processing Facility into FY 2015, and it continues to support the Nation's current and future defense posture and its attendant nationwide infrastructure of science, technology and engineering capabilities. We are also continuing to make the investments necessary for maintaining continuity of plutonium capability at

Los Alamos National Laboratory while reducing safety risks in the Chemistry and Metallurgy Research Facility and PF-4.

The budget request also includes funding for Defense Nuclear Security (DNS) to support DOE's physical security reform efforts emphasizing mission performance, responsibility, and accountability. The request also provides funding within Weapons Activities to sustain emergency response and nuclear counterterrorism capabilities that are applied against a wide range of high-consequence nuclear or radiological incidents and threats.

In short, the budget request continues to support interconnected critical life extension programs; rebuilding of infrastructure; and the continuation of the science and engineering base that we will need in the long run for certification of the nation's stockpile.

Defense Nuclear Nonproliferation

The Defense Nuclear Nonproliferation (DNN) FY 2015 budget request is $1.6 billion, a $399 million reduction from FY 2014. The Office of Defense Nuclear Nonproliferation continues to support U.S. leadership in nonproliferation initiatives both at home and abroad that increase global nuclear security. While we will continue to support a very robust program, the DNN budget reflects a substantial reduction, which is a result of difficult choices within our prescribed budget caps. Further, more than half of the reduction to DNN's budget is due to reduced funding for the Mixed Oxide Fuel Fabrication Facility.

DNN has had many successes in recent years. Since the President laid out his nuclear security agenda in 2009, DOE's Office of Defense Nuclear Nonproliferation (DNN) has removed or confirmed the disposition of over 3,000 kilograms of highly enriched uranium – enough material for more than 100 nuclear weapons. These removal activities have resulted in eleven countries plus Taiwan becoming HEU-free. DNN has also overseen the downblending of roughly 13 metric tons of surplus U.S. HEU, and cooperated with Russia in the downblending of about 2 metric tons of Russian HEU. I have just returned from the Nuclear

Security Summit in The Hague where the U.S. and Japan announced a program to remove hundreds of kilograms of HEU from Japan's Fast Critical Assembly.

After the conclusion of a four-year accelerated effort, the budget request supports continued efforts to secure or eliminate the world's most vulnerable nuclear weapon materials. The Global Threat Reduction Initiative will continue to convert or shutdown HEU reactors, remove vulnerable HEU and plutonium, and protect additional buildings containing high-priority materials. The research and development program will continue to improve capabilities in nonproliferation and foreign weapons program activity monitoring.

The Fissile Material Disposition program remains a vital commitment. However, as part of an ongoing analysis of options to dispose of U.S. surplus plutonium, it has become apparent that the Mixed Oxide (MOX) Fuel Fabrication Facility will be significantly more expensive than anticipated, and therefore, the budget request places the MOX Facility in cold stand-by while the Department evaluates plutonium disposition options. While we remain committed to the disposal of the 34 metric tons of weapons plutonium, we must go into a standby mode while we look at the full range of options.

Naval Reactors

The Office of Naval Reactors supports the U.S. Navy's fleet of aircraft carriers and submarines by maintaining its unique infrastructure and advanced naval nuclear capabilities. The FY15 budget includes funding for Naval Reactors operations at four Program sites including two laboratories, two operating prototype training reactors and spent fuel handling operations

Naval Reactors' request for FY15 is $1.4 billion, an increase of 26 percent ($263 million) over FY 14 spending levels. The increase is critical to ensuring maintenance of the high standards required to operate the U.S. Navy's nuclear-powered Fleet and executing its National Security mission. It further funds research, development, engineering and testing required to support operating and future nuclear powered warships.

The Program is advancing the design of the life-of-ship core for the OHIO-class Replacement submarine and meeting scheduled milestones for manufacturing and development efforts being performed as part of the Land-based Prototype Refueling Overhaul. Naval Reactors continues conceptual design for recapitalizing its spent fuel handling facility in Idaho. The facility is critical to meeting the Navy's aircraft carrier refueling schedule.

NNSA Federal Salaries and Expenses

The FY 2015 budget request includes $411 million for NNSA Federal Salaries and Expenses, formerly the Office of the Administrator, to support the staffing and Federal support needed to meet mission requirements. The $33 million increase over FY 2014 primarily results from the congressionally-directed transfer of Corporate Project Management and $20 million to move the Albuquerque Complex to a different leased facility.

Management and Performance

The FY 15 budget request provides $6.5 billion for management and performance programs, to support efforts to manage more effectively and to meet our legal and moral obligations to clean up nuclear waste from the Cold War. As mentioned, a suite of efforts supported by the budget aim to improve how effectively we carry out our missions for the American people.

The budget request moves responsibility for the Environmental Management program from the Under Secretary for Nuclear Security into a mainline responsibility for the Management and Performance Under Secretary in order to improve departmental management and execution of some of our most technically-complex cleanup missions. We are currently implementing a reorganization to establish an enterprise-wide approach to health, safety and security that improves both execution and accountability. We continue to support diversity, small businesses, and Native Americans across activities at the Department.

We are pushing forward initiatives to improve the strategic partnership with the National Laboratories including by establishing a National Laboratory Policy

Council and a National Laboratory Operations Board to address strategic and management issues with leadership from the Department and the Laboratories. We are also working to improve delivery and reduce the cost of human resource functions and IT services, to strengthen management through new cyber and incident management councils, and to institutionalize more effective enterprise-wide project management by convening a senior-level working group with representatives from across the Department.

Environmental Management

The Environmental Management (EM) program is responsible for the cleanup of millions of gallons of liquid radioactive waste, thousands of tons of used nuclear fuel and special nuclear material, and large volumes of transuranic, mixed, and low-level waste and contaminated soil and water. The program also supports the deactivation and decommissioning of thousands of excess facilities across the complex.

The EM Program has achieved a number of recent successes. To provide just a few examples, the program has completed cleanup at 91 of 107 sites across the country and significant portions of the remaining 16 sites. Sites that once housed large industrial complexes, like Rocky Flats in Colorado and Fernald in Ohio, are now wildlife preserves. In December 2013, EM closed two additional radioactive waste storage tanks at the Savannah River Site, a major milestone that brings the total number of tanks closed to six. At Oak Ridge, EM recently completed demolition of the K-25 facility, a mile-long, facility that was once the world's largest building under one roof. EM has decommissioned and demolished another 2 million square feet of excess facilities at the Idaho National Laboratory. And at Los Alamos National Laboratory, EM is on track to meet its commitment to complete the removal of all above-ground combustible transuranic waste by the end of June, despite the temporary closure of Waste Isolation Pilot Plant.

The FY 2015 budget request provides $5.6 billion for Environmental Management to meet the Nation's legal and moral imperatives for environmental remediation at DOE sites. The budget request continues to support cleanup progress at 16 sites across the DOE complex, including continued progress on environmental

management of the former uranium enrichment facilities at Oak Ridge, Portsmouth, and Paducah. EM has successfully completed many cleanup projects. What remains are some of the most complex cleanup efforts.

For example, the request supports continued construction of the Hanford Waste Treatment and Immobilization Plant (WTP) and efforts to resolve the project's remaining safety and technical challenges. Consistent with the Department's revised option for WTP, which is designed to move the WTP toward immobilization of waste as soon as practicable while resolution of technical issues continues, the FY 2015 budget includes support for analysis and preliminary design of a Low Activity Waste Pretreatment System. This approach demonstrates a commitment to complete the Waste Treatment Plant in a realistic and sustainable way. This will give Congress and the affected communities' stronger confidence in the Department to get the job done. We will also continue making tank waste cleanup progress at Savannah River and Idaho.

The Budget also proposes $172 million for Legacy Management (LM), the final element of site remediation and closure after active remediation is complete. LM fulfills the Department's commitments to ensure protection of human health and the environment and ensure all contractual obligations are met.

Conclusion

The Department of Energy's FY 2015 budget request will allow it to deliver the innovative and transformative scientific and technological solutions to energy, security, economic, and environmental challenges facing the United States in the 21st century.

Through its Science and Energy programs, the budget request will further the President's Climate Action Plan to cut carbon pollution while reducing America's dependence on foreign oil and will support an all-of-the-above energy strategy. The budget request for Nuclear Security programs will advance the President's vision for reducing the levels of nuclear weapons in the world, strengthen nonproliferation efforts, and combat nuclear terrorism. Finally, the request for Management and Performance programs will allow DOE to address the legal and

moral imperative of cleaning up legacy nuclear waste and to better manage our programs on behalf of the American people.

Thank you, and I would be pleased to answer your questions.

Mr. SIMPSON. Thank you, Mr. Secretary.

There are several issues that I want to talk on, which I will as we have different rounds of questions here, whether it is what is happening with a variety of the programs that you propose, what is going to happen with MOX, what is going to happen with USEC and other proposals and what the department's plan is for those things.

But first, as a former member of the Blue Ribbon Commission and now as Secretary of Energy, what is your view on one of the more controversial issues that has divided the House and the Senate and the administration, of how we are going to address our nation's nuclear waste problems, and what does your fiscal year 2015 budget request do in order to comply with the Nuclear Waste Policy Act and move forward towards the safe geological storage of nuclear waste across the country? Because if we don't solve this problem, nuclear energy is not going to move forward as it should.

Secretary MONIZ. I certainly agree, Mr. Chairman, with the importance of our moving forward on waste management.

And, perhaps not surprising, as you noted, as a former member of the Blue Ribbon Commission, and also as an analyst of these issues in my previous academic life, I strongly support the approach laid out by the Blue Ribbon Commission and in all of its key aspects endorsed by the administration.

The key elements, clearly, are a consent-based approach, and any parallel pursuit of geological isolation and consolidated storage, starting with and hopefully independent of some of the discussions that you have referred to with regard to waste management, hopefully promptly moving towards something that it seems everyone agrees is critical, and that would be at least a pilot facility that would accept spent fuel from shut down reactors. So these are the key ingredients, we believe. There are many other organizational issues, but those are the key high level ingredients.

I do want to emphasize that, as you know, we all know there have been some court rulings, one with the Nuclear Regulatory Commission in terms of restarting its process. We are providing the technical information that is required in terms of ground water, and in fact, we are making very good progress, and I think it is fair to say that we will certainly be delivering that to the NRC this quarter for their moving forward.

So in the budget request, the key issue is that we are proposing activities, all certainly authorized under the Nuclear Waste Policy Act, to advance on issues like transportation and storage that we believe are absolutely essential for pursuing any waste strategy, certainly the consent-based strategy.

Mr. SIMPSON. One other question, and I don't know quite how to answer this—or to ask this question and make it so that you can answer it.

As I said in my opening statement, one of my concerns about the Department of Energy has been the stop-and-start strategy we have had ever since I have been on this committee. We start a new program, we end a new program, we start another program, we end that program, we start another program with every changing secretary, with every changing president, whatever. And while you allow and have to allow an administration the flexibility to insti-

tute the things that they ran on, these are long-term projects and it seems like we oftentimes don't get anything done because we keep this stop-and-start sort of strategy.

Where do you see the Department of Energy? I will be upfront. I am a little concerned about SMR's, which is the road we are headed down now, with the recent B&W announcement, and I don't know how that is going to affect the SMR program or give us pause to think about the SMR program.

Where do you see the department 5 years from now, 10 years from now, 20 years from now? What is your vision for this department?

Secretary MONIZ. Well, if I start at the high level of the vision——

Mr. SIMPSON. Yeah.

Secretary MONIZ [continuing]. And then we can narrow down to some particular issues.

First of all, I think there are two big kind of pillars that I see in terms of how we address our missions.

One is that ultimately the major strength of the Department of Energy across all of its missions is, I would go so far as to say it is a science and technology powerhouse, and it is the application, the development and application of science and technology to these critical areas, with our national lab system being an important part of that, not exclusively, but a very important part of that at its core.

Then the other thing I would say is I think we have, and I hope this will have 5- and 10-year life, through our reorganization, emphasized the three big things we must commit to the American people: the energy-science agenda, as we have described and then we can go into that in more detail in terms of what it means, in terms of energy security, in terms of transformative clean energy, how we accelerate that, et cetera; nuclear security, an absolute responsibility for the safety and reliability of the stockpile, without testing, as certified annually to the present and keeping nuclear materials safe; and third, the management and performance.

I completely agree with the statements that you have made in the opening that we should not underestimate the substantial number of successes in programs and projects, and there are many, but there are too many that have suffered this issue of major cost overruns, with a common theme, well, an almost common theme, at least, with these projects that are baselined, so-called baselined before the projects are well understood at all, and I can go through on specific projects what that means.

So my view is that on the energy and science first of all, number one, we must maintain for the long-term, I think our very successful support for the physical sciences and engineering in this country. That is a base for just about everything.

On the energy side, I personally, there is no question, I am very committed to all of the above. I do believe, as the President has stated, we have to move on fossil, nuclear, renewables and efficiency, all with a view towards the future clean energy economy, and we can go back to the IPCC report later on that was mentioned by Ranking Member Lowey.

So I think it is very important that we maintain that broad portfolio. Your statement that administrations may have different emphasis in different areas, but I think it is important that we sustain that for the long-term.

On the nuclear security, we must meet our commitments to the Department of Defense, and this budget does, and as you know, it is not without controversy, it does commit to the W–76, to the B–61, to the W–88, projects on schedule, that supports the triad.

We had to stretch out some other things to do that, but we must do that, but we must remember that this is not only a job for this decade, it is a job for 5, 10, 25 years, which means we have to pay equal attention to maintaining the science and engineering base in our nuclear laboratories for supporting that critical mission.

And management and performance, as I have said, I think we need to bring discipline. We have some active discussions going on around various projects, whether it is in South Carolina, Washington state, we can name others, like Oak Ridge, but we are trying to bring a discipline of recognizing the facts and responding to them and putting together reliable baselines when we have the information to do so.

I think we are taking some creative approaches. I will mention, for example, in Washington state with the big WTP project, probably the biggest and most complex of all of our environmental cleanup projects, we have proposed to the state a new framework that we believe reflects the physical realities and yet moves quickly.

Clearly the state said they have some different views, but I want to emphasize the commonality. We both agreed that we can move forward with the low activity waste, we both agreed, that there are technical problems that must be resolved. So I think we will just have to have a discussion now over the next few months about how to do that.

UPF at Oak Ridge, I will just mention a second example. I am sorry I am going on so long, but it was an open-ended question.

Mr. SIMPSON. Yes. It was.

Secretary MONIZ. There, I think again, we are trying to bring a new kind of discipline, where in this case, the key issue is, as was done for the plutonium facility at Los Alamos, getting, frankly, laboratory leadership, in looking at new ways to accomplish the mission at a lower cost.

So we are committed to that project, we are committed to a budget cap, we are committed to a date, and right now we have an outstanding red team led by Tom Mason, the director of Oak Ridge, looking at that. We expect a report from him within weeks on that.

So this is the kind of discipline we are trying to bring to this, and I think, and I agree, we need this to support the vision and our ability to execute the critical missions that we have assigned to us.

Mr. SIMPSON. Thank you.

Ms. Kaptur.

Ms. KAPTUR. Thank you, Mr. Chairman.

I would like to ask the Secretary if he thinks America is winning or losing the battle on becoming energy independent here at home?

This is a chart from the Energy Information Administration showing from after World War II all the way until the great recession of 2008, continuing increase in imports and then, of course, with the deep recession, we had a reduction, and we have been doing better at home because of the Obama administration's policies, for an all-of-the-above strategy, but looking forward, Mr. Secretary, could you tell the American people what are the goalposts for going back to a growing economy, a robustly growing economy here at home, one where we are producing energy-related jobs in this country at a level commensurate with our population size?

What are the goalposts that the Department of Energy sets so that the American people know whether we are winning or losing? Can you comment on that?

And then secondly, can you tell us some of the inventions that the Department of Energy has sponsored that have made winning possible again for our country?

You might start with natural gas, for example. The people listening might not be aware of what the investments of the Department of Energy have done to help our country dig ourselves out of this incredible hole.

Secretary MONIZ. Thank you for the question, Ranking Member Kaptur.

First of all, it is clear that we are making dramatic progress towards relieving our dependence on foreign energy sources, particularly non-North American sources, and I want to emphasize that the work involves both the supply side and the demand side for having that balance.

So if we take oil, for example, which historically has always been the issue associated with energy and security, since we have never been major natural gas importers, for example, then we are on a trajectory largely driven by the unconventional production of oil as well as gas, but oil. We are probably going to get at least pretty close to 10 million barrels a day of production within a few years. It is a significant increase from where we were in that graph that you showed, and I think that will continue, and that is helping our balance of payments, which you referred to in your opening remarks as well as, you know, the energy security equation.

But what I want to emphasize, and this is very important for the independence idea, is that we are also focusing at the same time on three major directions to lessen our oil dependence. One is efficient vehicles both through the CAFE standards, but also through our technology developments, our manufacturing initiatives, to continue on this pathway.

This is already having an impact, oil usage for transportation has not gone up. We are getting carbon emissions, contributions, carbon lowering, carbon emission lowering from that.

Second path, we continue to work hard on alternative fuels for our transportation sector. The President in his State of the Union gave a strong emphasis to natural gas coming into the transportation system more robustly, but, you know, on somewhat longer time frame maybe by the end of the decade. We are pushing and making real progress on the whole range of advanced biofuels, including our work together with the Department of Defense and the Department of Agriculture. And then——

Ms. KAPTUR. I want to compliment you on that, Mr. Secretary.

Secretary MONIZ. Thank you.

The third is the continuing focus on electrification of vehicles. Battery costs have come down by about a factor of two in the last 4 to 5 years, we need another factor of two to three for the large scale commercial market, but we should not lose sight of the fact that, you know, last year almost 100,000 electric vehicles were sold in the United States, so we are making real progress. So it is both on the supply and demand side.

Gas, we will continue to be—our EIA projects continued increases in our gas production, and, of course, we have provided so far conditional approvals, one final and five are at FERC right now, conditional approvals for the export of about 9.3 billion cubic feet per day. That is within the range of studies that say this should not have major domestic price increases, but yet I think sometimes we don't put this in perspective. 9.3 billion cubic feet per day is almost within a whisker equal to the amount of LNG exported by Qatar, currently by far the world's largest LNG exporter. And that goes back to the issues also of the economy and jobs and all kinds of issues.

LNG, I mean, natural gas has, of course, given a big boost to our manufacturing sector. Probably $125 to $150 billion have been invested in new manufacturing capacity directly associated with natural gas.

Then in addition, of course, nuclear, renewables and efficiency all contribute to the energy security equation quite clearly.

In terms of the second part of your question, some of the department's contributions in these areas. Well, first of all, if we talk about the unconventional oil and gas, the department in its very first years, in the late 1970s and to 1980 started the first characterization of these unconventional reservoirs, and then less well known, but for the next really 20 years, a combination of the administration through FERC and the Congress through a time-limited tax incentive took that information and had technology transfer working with the independent companies to develop the technologies that are now being used to produce all this oil and gas. That was a very interesting program, which I could describe in more detail. So those are examples in those areas.

With respect to coal, the department really brought in the first technologies for scrubbers in the 1980s, critical, and of course now we are looking at scrubbers for carbon dioxide, carbon capture for coal plants into the future.

With renewables, I think it is pretty clear that the department has been critical in stimulating the deployment of renewables and the advancement of renewables. A good example is from the loan program where the first five utility scale floatable tank plants were given loans, loan guarantees, and now ten more are going forward with private sector funding.

So I could go on, but I think I have taken too much time, but I think it is a very good picture in terms of, where we are and where we are going in terms of energy security.

Ms. KAPTUR. You know, Mr. Secretary, I have been very impressed with your systemic approach to many issues, for example,

on the grid, looking at modernization of the grid, and also your work on the departmental management structure itself.

I just wanted to take a second to say that if one approaches the systemic needs of manufacturing America, where a third of jobs have been lost in this country, over the last quarter century, I would encourage you to take as you are sending out requests for proposals, taking a look at manufacturing corridors, and I know you are, but the Duluth to Buffalo corridor, which has suffered disproportionately in this country, and it is a corridor that has over the years been involved in coal.

Coal-fired utilities, I don't have to tell you this, I say this for others, coal shipments by sea, by rail, the largest number of coal-fired utilities have been shut down in this region, and we have this entire Great Lakes, St. Lawrence seaway corridor that really needs additional attention, and so I would urge you to think in the way that you are functioning in the department to look at adjustment policies that would allow these communities to recover more quickly.

So, for example, if one is evaluating the shipment of natural gas, let's say, I don't know how that is all going to turn out, but the Great Lakes is the shortest distance between the United States and the ports of northern Europe, for example. If this region is not being considered as new staging areas are developed, well, what does that mean for the future? I think if you were to overlay where the pain is greatest in terms of manufacturing and a transition from our traditional power sources to something else, a systemic approach in advanced manufacturing and transition might be incorporated somehow in the proposals that you are seeking, because it is a corridor-wide challenge.

And it isn't just one company; it is a network of companies, it is a network of systems that are just having to adjust to this change, and there isn't really a coherent umbrella as exists, for example, in the west with the Bureau of Reclamation or in the south with TVA, for example. Those aren't perfect, but we don't have anything like that in our region, so the Great Lakes suffer more.

Some people say, hey, Marcy, you are a merchant economy, you know, love every minute of it. Well, you know, some of the minutes have been pretty rough.

So I am just saying as you look at energy transition, please take a look at this corridor, and I know you are, but I am just encouraging you on in those efforts.

I don't really have a question there. That was just a comment, but do I have time for one other question, Mr. Chairman, which can be answered very quickly?

Mr. SIMPSON. Very quickly.

Ms. KAPTUR. Okay. In your biofuels research at the department, and I am very close to that issue, because Tom Harkin and I drafted the first title to an agriculture bill dealing with biofuels. It appears you have devoted significant research dollars to cellulosic and alcohol-based fuels, but oil crops, I have a question about, can you clarify DOE's biofuels research priorities and the funds dedicated both on the sugar side and on the oil side? Is there a difference?

Secretary MONIZ. Well, I think first of all, if one looks at scalability, then the cellulosic and energy crops have the largest

scale potential, however, with the oils, I will mention two examples, or maybe three.

The first, in the DOD, DOE, USDA program, with the Defense Production Act authority that we were given in fiscal year 2014, we will be having our resources from the three agencies support, I believe it is, four projects, two of which are based upon oils and fats, so two of those four, I believe.

Secondly, within our own program, there is the program around algae, which is an example of oils production.

And third, and this one I know less about, but I can get more information for you later, is some work on genomics to looking for greater oil production from some energy crops.

Ms. KAPTUR. Thank you. We will look for additional information to be placed in the record on that question.

Secretary MONIZ. Okay. Great.

Ms. KAPTUR. Thank you, Mr. Chairman.

Mr. SIMPSON. Thank you.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I was just struck by how remarkably quiet it is in here. It must be your firm leadership that has worked to make everybody so acquiescent here, but——

Mr. SIMPSON. We all miss you here, but glad we could be——

Mr. FRELINGHUYSEN. Well, I am not here to stir things up, but, no, I haven't been on this committee for 20 years, so this is the quietest group that I have ever witnessed, and if——

Secretary MONIZ. Boring witness.

Mr. FRELINGHUYSEN. No, no. No. If it was based on likability, may I say, I have heard quite a few secretaries, we welcome your presence at the Department of Energy, and——

Secretary MONIZ. Thank you.

Mr. FRELINGHUYSEN [continuing]. And anything you can do, if you will pardon the expression, to shake it up and get more performance and better management practices, God speed to you. It is difficult.

Secretary MONIZ. Thank you.

Mr. FRELINGHUYSEN. Let me just say for the record, I am disappointed with the numbers for fusion, both domestic and 18 percent reduction, I am going to leave that aside, but there may be some reasons for it. I don't want us leading from behind in that area. There we, too, work with our allies.

I would like to focus on one of the concerns raised by Chairman Simpson, the ability of the National Nuclear Security Administration to meet the needs of the Department of Defense, and I quote from the chairman's remarks: "Let me rephrase that to meet the needs of the Department of Defense in a way clearly communicated to and approved by Congress. It does us no good to have the Department of Energy agree to a work plan with the Department of Defense which we cannot afford, and your department's credibility has been sorely damaged by proposing cost plans which are rapidly exceeded." It goes on, "this is a three-way relationship that is critical to security of this country, our country and needs your personal attention."

I know you have commented on it. I want you to make some more personal observation. Mr. Visclosky and I have sort of shifted. We are both on this committee, but we have shifted to roles on the defense appropriations committee. We would like to know where we are going in this area. I know there are issues of affordability, but you wouldn't have a department unless we had passed the Atomic Energy Act. I mean, whatever you have here, the sciences you have, the pyramid was built on the nuclear deterrent, and I would like to have some more personal reassurance from you that you are working closely with the Department of Defense.

Secretary MONIZ. Thank you.

Frankly, I think we have reenergized the relationship with the Department of Defense, but I want to emphasize as well, it is not only with the Department of Defense, it is also with the National Security Council and OMB in what I think has been coming up to the fiscal year 2015 budget a very robust process, putting on the table the——

Mr. FRELINGHUYSEN. With all due respect to the OMB, we know they have an inordinate amount of power and influence over the process, but indeed you have certain responsibilities, which you have mentioned, which is the whole issue of certification, and we have these vast——

Secretary MONIZ. Right.

Mr. FRELINGHUYSEN [continuing]. Complexes where remarkable work is done to give you that assurance, but you still have to tell the story the way you need to tell the story but adhere here to OMB directives.

Secretary MONIZ. No. I will continue in that, sir, but I just wanted to emphasize, because I do believe that the proviso added in the chairman's statement about the affordability part is important, which is why on the policy side, clearly I think DOE, DOD and National Security Council are there, but again, we have to make it affordable and so I think OMB was a very important part of a four-way discussion.

Secondly, as you know very well, last week Mr. Augustine and Admiral Mies testified on the initial findings of the congressional panel and they pointed out a number of the systemic issues that must be addressed, I agreed personally with all of those.

And by the way, I think we are addressing them. We have a lot more work to do. We can talk about that. But I also want to note that in their testimony, they twice referenced bluntly the importance of an engaged secretary in these issues. And I can assure you that you have and will have as long as I am there an engaged Secretary in these issues. I think the process that led to the fiscal year 2015 budget request——

Mr. FRELINGHUYSEN. You are engaged in them and I say engaging.

Secretary MONIZ. That is not a universally shared view, but with those who are engaged.

So I think a very important result, frankly, which I alluded to earlier is in this process, there came at the highest level a kind of a renewed look at and a renewed commitment to the fundamental strategy laid out in the nuclear posture review for how we are going to have a reliable triad, sustained over time, aligned with

what one sees as the strategic challenges we face in this dimension, and those who have perhaps gotten a little more notice in the last month, shall we say.

To do so, that is where the affordability came in. We had to put on the table, insist, what is it really going to cost, to do this. We had to stretch some things out in the plan. You will see, for example, the cruise missile had to be pushed out. But then to make it work goes back to the other question, that, well, to say we can afford it means we are going to have to meet the budget targets for, for example, the re-modernization of the complex.

So that is where, again, like this UPF story comes in, we are absolutely committed to a $6-and-a-half billion dollar budget, we are absolutely committed to getting out of Building 9212 by 2025 at the latest, and we are having to look creatively with our red team led by Tom Mason in terms of, how do we restructure the project to have the core capabilities absolutely preserved but make sure we come in on that budget. So I think it all has to fit together, and I feel we are making progress.

Mr. FRELINGHUYSEN. Well, I am glad you are making progress. And, of course, the nuclear posture is linked to the defense posture, and God only knows in recent months the defense posture seems to have been shifting all over the damn place.

We have learned things about the Ukraine and Budapest agreement, and the Iranians are not slowing down what they are doing, the North Koreans are doing what they are doing. There are nuclear powers out there that some very strange and apparently, you know, some critical things can happen at any time, but I think this puts a huge burden on you working very closely with the Department of Defense, even given the budget limitations, to come up with a plan that gives us more——

Secretary MONIZ. Right. We would love to have a chance to come and talk more about the strategic directions maybe in a different environment.

Mr. FRELINGHUYSEN. Yeah.

Secretary MONIZ. And I think that would be extremely useful, because, in fact, another thing that I think Norm Augustine in particular emphasized is that for a little while, there has been maybe less focus in the national security discussions on the nuclear deterrent issues, and I think we——

Mr. FRELINGHUYSEN. It could be somebody whose opinion we—you know, we respect and——

Secretary MONIZ. Absolutely.

Mr. FRELINGHUYSEN. And a credible asset.

Secretary MONIZ. And I completely agree with that statement that he made, and so that is where, frankly, if we could get more interaction on this and strategic thinking three-way, as you mentioned earlier, I think that would be enormously helpful in and of itself.

Mr. FRELINGHUYSEN. Okay. Well, I know Mr. Visclosky is here for himself, and I just appreciate the opportunity to work with him and the chairman and the ranking on this critical issue.

Thank you very much.

Secretary MONIZ. Thank you.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. SIMPSON. Thank you, Mr. Chairman. We can certainly arrange some of those meetings between all of us and so we can get together and knock heads and find out where we are.

Mr. MONIZ. That would be great.

Mr. SIMPSON. Mr. Fleischmann.

Mr. FLEISCHMANN. Thank you, Mr. Chairman.

Mr. Chairman, before I begin with my questions, I want to welcome Secretary Moniz.

Mr. Secretary, I want to personally thank you and your undersecretary. So this whole subcommittee will know, the Secretary has taken his time to meet with me personally on more than one occasion, has come to Oak Ridge, and we have had the hard conversations on so many complex issues. I am privileged to represent Oak Ridge, once known as the secret city. This is a great city, and I have said in my short tenure in Congress, I want to make sure it is the not-so-secret city. We have got a lot of everything that is great there. This was the birth place of the Manhattan Project, this is where we won the Cold War, and this is where we continue to lead the Nation.

We have got, in my view, the premier, the premier lab at ORNL, we are doing super computing, advanced manufacturing, we have got the Y–12 plant, and, Mr. Secretary, I want to thank you for your commitment to building the UPF. I know it has had problems. I have a strong commitment to see the UPF built. The nation needs it. We have had some miscues, but we need to continue to move forward. I want to commend you for choosing Tom Mason to lead the red panel. I know they are doing good work, and we look forward to their report, but the men and women who work there deserve a safe facility. I know you have been to 9212, you have seen the facilities there. The working conditions are deplorable. We have got to fix that, not only for them, but for the nation.

So let me say thank you for all you have done, and I have enjoyed working with you and your assistant secretaries who have come into the district, not only in Oak Ridge, but also to Chattanooga, and I appreciate that.

Another issue that is less glamorous, but critically, critically important to our community in Oak Ridge, is land transfers. Mr. Secretary, this issue had been stalled for years where we clean up formerly dirty sites, legacy sites from the cold war and before, and we get that back to the community. You personally got the ball rolling on that again, and I thank you. We need to get these properties back on the tax rolls and away from the payment lieu of taxes. This revenue is critically important to Oak Ridge, so I thank you for those.

I am going to ask a couple questions because I appreciate the fact that you have, I think, very thoroughly stated your commitment to UPF. And thank you. We will move forward with that.

I want to talk about American Centrifuge, though. The American Centrifuge Project benefits our national security, preserves our unique manufacturing capabilities, and supports an American nuclear industry. The 2015 budget request did not fund ACP.

Can you please tell the committee your plans on the status of the American Centrifuge Project. And what are your plans for the future?

Secretary MONIZ. Thank you, Mr. Fleischmann.

And I also have enjoyed our opportunity to work together, especially in the areas that we agree on.

Mr. FLEISCHMANN. Yes. Thank you.

Secretary MONIZ. The ACP is an issue that we are working very hard on. Number one is there is no question that we continue to have a need to preserve an American technology for enrichment for defense purposes. Obviously, the ACP right now is the technology. It has successfully gone through meeting its technical milestones in the RD&D project that we have now finished funding.

We have clearly a situation that right now is, perhaps unfortunately, very fluid for a couple of reasons. One is that the fiscal year 2014 appropriations funded the ACP facility and the associated work, which, for example, Oak Ridge is part of, as you well know—funded that facility through April 15 and provided the authority for reprogramming up to $57 million, I believe it is, out of other NNSA funds to get us through the rest of the year. We have to get through the rest of the year.

So, actually, Acting Administrator Held I think is here somewhere—there he is—and is very actively seeing which left pocket will go to the right pocket to keep this going. Well, we have to keep it going this year. So that is our immediate issue, is to get that funding. And, frankly, it would be very, very desirable to make sure we can keep the 120 machines spinning there.

Now, in our management approach, having accomplished the RD&D program and having this transition in the funding, then we are looking to manage the program going forward, actually, through Oak Ridge, in fact, which, of course, is the origin of the technology. So we have to preserve the technology, we have to preserve the IP, and we have to think about how we are going to go ahead to meet our national security obligations, which most immediately—it is not immediate, but the nearest term issue will be for tritium production for the stockpile.

Mr. FLEISCHMANN. Thank you, Mr. Secretary.

Mr. Chairman, do I have some more time or——

Mr. SIMPSON. Let's move on, and we will come back for a second round, if you would.

Mr. FLEISCHMANN. Thank you, sir.

Mr. SIMPSON. Mr. Graves.

Mr. GRAVES. Thank you, Mr. Chairman.

Mr. Secretary, good to see you. And, first, let me thank you for the department's support of Nuclear Power Plant Vogtle. I think you have demonstrated the importance of that project not only for the State of Georgia, but for the entire southeast, and I want to thank you for that.

And in a somewhat related matter, the chairman referenced some issues within the department in managing various projects and mentioned MOX, which, as you know, is in South Carolina on its border with Georgia. And I want to touch on that project just a minute and see if you could help us understand what is going on there.

Your statement, in essence, says it is being mothballed and that, "It will be significantly more expensive than anticipated." Maybe you could go into that a little bit.

Could you share with the Committee—is that a result of the project itself or is it a result of what the department has requested in change orders?

Because it is our understanding that there have been many change orders requested sometimes once a week, if not more than that, in some cases costing hundreds of millions of dollars.

My first question would be: Is putting this project on cold standby more a result of the original scope of the project or a result of the department's requested changes?

Secretary MONIZ. Well, I thank you for the question, Mr. Graves.

And, by the way, it was a pleasure to be in Georgia for the Vogtle announcement, and I will be back in Georgia in a few weeks, in fact.

Mr. GRAVES. That's great to hear.

Secretary MONIZ. With regards to the MOX Facility, I think it is a pretty, first of all, uniform understanding that we are talking now about a 30-billion-plus life cycle cost, which is quite a bit beyond what was originally bargained for.

I think the origins of that are several. One is that—and the capital project itself is nearly a factor of three beyond original projections, certainly two and a half, at least.

The first one of the problems was this baselining before the project was really understood. Secondly, there were a number—at least now, with hindsight, looking back—from what I understand, there were a number of assumptions made by the contractors in terms of how the experience of building a similar plant in France would transfer here, and it turned out there were a lot of incorrect assumptions both in how the plant would be physically constructed, but, also, in terms of interactions on safety standards, things of this type.

We, of course, have NRC regulation of the plant, and I think there were a number of unanticipated issues there which substantially escalated the cost. Partly, it is performance. And, you know, we put together last June a really, I think, extraordinarily strong project team headed by one of my senior advisers that I recruited from the private sector—a lot of project experience—found a lot of holes, frankly, and there were some management changes that were needed and implemented.

And, fourth, of course, there was a general escalation due to lack of funding profile being met and stretch-out and, as you know, that just continues to add money. So it is a lot of things that came together, and now the issue is—so this is a very important dialogue that we need to have with the Congress because, frankly, the issue is, "Okay. Is $30 billion lifetime something that can be supported for the disposal of the 34 tons"—by the way, there is a parallel 34 tons in Russia that would be disposed of by them, of course—"or not?"

So that is why we are saying, "Look, let's not do anything irreversible. But to protect the taxpayer money with the uncertainty of what is an affordable option going forward, let's have a look—a hard look at various options."

You know, in the 1990s, the National Academy of Sciences put forward something like 31 options for our plutonium disposal. We have narrowed that down to four or five to look at in more detail. So that is the proposal. And, look, this is a discussion that I think we are going to have to have with the Congress now over these next months.

Mr. GRAVES. All right. And I hope you do, and I hope it is an open dialogue.

I am listening to your response, and I didn't really hear any blame being put on the community or the contractor. More of it seemed to be related to the government or governmental changes or slowness in funding, but I would hope that they are still——

Secretary MONIZ. Well, if I may interject there, I am not leaving the contractor out of that equation. In fact, as I mentioned, I think there were some incorrect assumptions made in terms of transferability of the French.

So I think there is—you know, if we want to do blame, there is plenty to go around. I am interested in solving problems. So I just want to move forward and see what we can do.

Mr. GRAVES. Great.

Secretary MONIZ. We are committed to disposing of the 34 tons of plutonium.

Mr. GRAVES. Could you maybe share—what is the cost of cold standby? Is there a projected cost or a study——

Secretary MONIZ. So we are——

Mr. GRAVES. Because we are talking about a facility that may be 60 percent complete at this point.

Secretary MONIZ. Yes. It depends how one counts. But, yes, that is fine.

So we believe—I think it is—215 or $220 million for fiscal year 2015 would allow us to do a controlled transition to this State with no irreversible harm.

Because MOX, by the way, is one of the options that is still on the table to be looked at. The problem is—and I understand it, and there is no way around it, and it is a challenge—it would be a real challenge—the workforce.

Mr. GRAVES. Right.

Secretary MONIZ. You have a workforce that has—by the way, the safety record up to now has been exemplary in building it. So there is not anything about the workers.

Mr. GRAVES. Okay.

Secretary MONIZ. So we have to manage this, and I think the best way to manage it is by trying to sit down and keep looking at it.

Mr. GRAVES. Well, it is good to hear that MOX is still one of the options being considered. And you referenced the responsibility for taxpayer dollars, and that is certainly of interest to this committee.

And I would be interested to know what the other alternatives are. Has that been determined yet or is that part of the study?

Secretary MONIZ. Well, there are both reactor alternatives and nonreactor alternatives. And there is another issue, that the reactor alternatives satisfy the agreement that we have with Russia at this time.

The others would require a reopened dialogue. Dialogue right now is not so simple. So, anyway, yeah, we will spell out those—we are looking at four alternatives—four options specifically.

Mr. GRAVES. Right. Okay. Thank you, Mr. Secretary.

Secretary MONIZ. And I will say preliminary view is that two of the other ones, frankly, are not less expensive than MOX.

Mr. GRAVES. Okay.

Secretary MONIZ. But we are still working it.

Mr. GRAVES. Thank you.

Thank you, Mr. Chairman.

Mr. SIMPSON. Mr. Visclosky.

Mr. VISCLOSKY. Thank you, Mr. Chairman.

Mr. Secretary, it is good to see you back.

Secretary MONIZ. It has been a long time.

Mr. VISCLOSKY. And I am very happy to see you in your position. I think you bring not only intellect, but energy, thoughtfulness, and some strong management to the position. And I do encourage you as you proceed in your responsibilities to consider everything possible to strengthen management at the Department of Energy.

I have served on this subcommittee for a long period of time and have grown very tired, not from you, but others coming in and saying, "Well, this was a unique project, one of a kind, and that is why we have management problems." That is why we have good managers. So I would encourage you in that.

I also do want to thank the chair and follow up on Chairman Frelinghuysen's comments as well. In his opening statement, the chairman said it does us no good to have the Department of Energy agree to a work plan with the Department of Defense which we cannot afford, talking about the NNSA department. This is a three-way relationship that is critical to the security of this country, and it needs your personal attention.

I would certainly associate myself with the chairman's observation as well as Mr. Frelinghuysen. Fortunately—and I say this very sincerely—I am very pleased that there is four people on this subcommittee who also serve on the Defense Subcommittee, given the interrelationship. I remain concerned, however, that we are going through modernization drills with some munitions that I have a question as to the delivery systems of potential existence into the future.

I continue, despite the answers we receive in the Department of Defense hearings that, "No. Everything is fine and our requirements are being met"—that, if those cost items that we are very concerned about on this subcommittee aren't on DOD's budget, that they can have all the requirements in the world and would trust that, at some point, if the communications aren't going well, if somebody hasn't thought out those requirements vis—vis the investments we need to have at NNSA—I would hope that there is some pushback and some positive tension, if you would, and that the subcommittee be made aware.

Because, again, I think it is very good that there is four people on both of these subcommittees, and we would want to make sure you are part of those negotiations as opposed to NNSA being told what to do and would encourage you very, very strongly in that.

And, again, associate myself with the chairman's opening remarks and Mr. Frelinghuysen's line of questioning.

The one question I would have is—apparently, there is a proposal for a HydroNEXT Program that over a 5-year period of time would have a $100 million proposal relative to hydropower.

Understand that there have been criticisms of their proposal—nothing new in our line of work—that the major constraints are capital cost, that the modular technologies of small dams require too much up-front investment, and that diverting water for electricity generation, particularly in the west, isn't practical.

Would you just have some comments, if you would, as to the criticisms that were raised.

And the second question I have: Is this in any way diminishing the department's attention to research on how we can best use tidal power and, also, rediverting resources from tidal power research to the new initiative?

Secretary MONIZ. Thank you, Mr. Visclosky.

And it is good to renew our dialogue after many, many years.

Mr. VISCLOSKY. You have held up a lot better than I have. That is all I have got to say.

Secretary MONIZ. No. No.

If I may just comment on your first statement before getting to your question. As we discussed earlier, I think then—the chairman, I think, took interest in maybe getting exactly the kind of dialogue that you described set up, if we could talk about—at a more strategic level about the issues going forward with the stockpile.

And I agree with you that those ultimately need to be discussed as well in the context of the delivery systems and the way one is postured. That is very directly relevant to the part of the program that was shifted downstream a little bit in terms of the cruise missile.

Mr. VISCLOSKY. Uh-huh.

Secretary MONIZ. With regard to hydro, first, let me say straightforwardly that, in the budget proposal, within the constraints, we increased the amount for the water program, but we did shift funds more to the HydroNEXT side than the Hydrokinetic. Again, I am happy in all of these issues to have a dialogue about that.

But right now what we saw was a very, very strong push coming out of the private sector in terms of an enormous potential for small hydro. They are talking about 70 gigawatts potential, and this is something, obviously, we have discussions with others. The Army Corps of Engineers for example is obviously critical in many of those discussions.

So that is what the budget proposal is at the moment, looking at what might be a relatively near-term, major additional low-carbon source with microhydro. A lot of people have come forward in the private sector with the idea that this could be a relatively short-term positive.

But to be honest, within the fixed budget—well, not fixed budget—we went up, but it did lead to a proposal for 20, I think, or 25 percent reduction in Hydrokinetic.

Mr. VISCLOSKY. Okay. Secretary, thank you.

Thank you, Mr. Chairman, very much.

Mr. SIMPSON. Mr. Fortenberry.

Mr. FORTENBERRY. Thank you, Mr. Chairman.

Mr. Secretary, welcome. We have never had the pleasure of visiting before. I am Jeff Fortenberry from Lincoln, Nebraska.

I want to tell you a quick story. I ran into an old friend recently. Danny Kluthe is a hog farmer. Have you ever spent time on a hog farm?

Secretary MONIZ. I cannot say that I have. No.

Mr. FORTENBERRY. There is a lot of energy there, let me just tell you.

And so Danny is an entrepreneur and very creative and a number of years back decided to capture, basically, the manure in a pit, and the methane that was generated off of there was used to produce electricity.

Secretary MONIZ. Uh-huh.

Mr. FORTENBERRY. Danny basically reconfigured his system so that now he is moving that methane into his truck, blending it in some sort of proprietary fashion, as I understand, with diesel and getting 70 miles to the gallon in his truck.

You are welcome to come see it. I think you would enjoy it.

Secretary MONIZ. Could we drive it here? That is interesting, obviously.

Mr. FORTENBERRY. The important policy point is this: The energy entrepreneurs who are out there who are working on distributed systems of energy generation and renewables are, I think, on the cusp of a lot of new innovative approaches here. And I appreciate what your disposition is on attempting to leverage the public resources department to unleash that potential. It is important.

But there are innovators out there like this who you might overlook in the sense—because they are so small, but, nonetheless, they are doing very, very important leading-edge things and helping solve some of the most critical problems regarding our own energy independence as well as environmental sensitivity.

The broader point I wanted to make is I want to emphasize something that Congressman Frelinghuysen said. To gather us, perhaps, in another appropriate setting with DOD officials and National Security Council officials to review and talk about the interactions regarding nuclear security strategy is of utmost importance.

And I would like—Mr. Chairman, I hope that we can accomplish this quickly rather than sitting out there—this is a goal that we need to do. This is an urgent task in a matter of weeks, not even months.

You had commented that there has never been, from your perspective, better interaction, dialogue, and, again, strategic thinking. We need to be a part of that. Perhaps one of the most important things that you and I can do in our time of public service is to ensure that we decrease the probability of the use of a nuclear device to as close to zero as possible.

Now, nuclear deterrence has an important role in achieving that, but so do other essential nonproliferation initiatives. In the Congress, I have helped form a nuclear security working group in order to try to help Congress—it is a bipartisan initiative—to get our arms around this spectrum of nuclear security issues, which is complicated and cross-jurisdictional.

Now, in that regard, I wanted to talk to you about the reduction of the defense nuclear nonproliferation budget. You suggest that their $400 million reduction is somewhat due to the MOX Facility issue.

But does it impact other nonproliferation initiatives that you are undertaking, such as the global threat reduction?

Secretary MONIZ. Thank you for the comment and question and certainly on the first part.

Again, I think this idea of us having a little caucus, maybe a sustained caucus, would be really very, very helpful, and I could not welcome that more.

Mr. FORTENBERRY. Mr. Chairman, what is the pathway to getting that done shortly? Sorry to be presumptuous and——

Mr. SIMPSON. We will talk later.

Mr. FORTENBERRY. Okay. That is a good answer. I will obviously be raising it. It puts an accent on its importance.

Secretary MONIZ. And the second point you made which I would like to align with is that we should be thinking about the nuclear weapons program and the nonproliferation program as really part of the same objective in terms of nuclear security, because sometimes they are viewed as kind of like alien programs.

Mr. FORTENBERRY. Right.

Secretary MONIZ. They are actually—it is the same objective, ultimately.

Now, in terms of the budget, there is no question that, for example, the GTRI program does have a reduction in this budget. I have said publicly that, you know, I am disappointed that we could not do a little bit better with that budget.

Mr. FORTENBERRY. Well, let's fix that. Why don't we fix that?

Secretary MONIZ. Well, it is the question of—well, with the 050 constraints, and balancing these priorities—we felt we just had to get the weapons program on track for—again, an affordable deterrent within the Nuclear Posture Review approach.

Now, in the GTRI, I do want—or the rest of the nonproliferation program, I mean, I do want to emphasize that we believe this is a strong program. Over the last few years, we have had a real kind of surge in that program in terms of——

Mr. FORTENBERRY. Appropriately so.

Secretary MONIZ [continuing]. In terms of the materials. But with this budget, we will still continue to have strong nuclear materials repatriation programs.

As I mentioned last—I think it was just last week in The Hague—made the announcement with Japan, which was a very important announcement, in terms of hundreds of kilograms of plutonium and HEU—weapons-grade HEU. We will continue reactor conversions. So I think, you know, it is an issue of how much we can do, obviously, but I do want to—we will have a strong program at this level.

Mr. FORTENBERRY. In terms of, again, prioritization—and we all have to make hard choices—we cannot react to a nuclear incident. We can't react. It is too severe. We have to prevent.

And the problem is the technology has spread. We are not in a post-World War II period anymore where you just had a very few

actors with access to this technology and capacity to use it, if they chose to do so.

Plus, the issue of transnational groups and the problem of loose material, again, trying to get our arms around the spectrum of potential threats in this regard, is complicated.

So I think it ties into what we all seem to be in agreement on of getting in another setting to talking about the interdependency of what you are doing, as well as the Defense, as well as the White House, but also ensuring that we are not somehow just considering these budgetary requests alongside other important things, but in terms of outcomes aren't quite as essential.

So that is my emphasis to you. And I hope that, as we move forward—you are talking about these programs being strong. In terms of a priority, it is absolutely essential. We cannot let something happen here.

Now, I have noticed that you have undertaken a management restructuring and created a new undersecretary for nuclear security.

Do I have that understanding correct?

Secretary MONIZ. No. Actually, that undersecretary was preexisting. It is equal to the administrator of NNSA.

Mr. FORTENBERRY. Is that what the change is?

Secretary MONIZ. No. No.

So the change really was in combining the undersecretaries of energy and of science into an undersecretary for energy and science, creating then a new undersecretary for management and performance and moving the environmental management program from the undersecretary for nuclear security under the management and performance organization.

Mr. FORTENBERRY. Okay. I am sorry. I misunderstood that.

Secretary MONIZ. No. No.

Mr. FORTENBERRY. I thought that was, again, an attempt to do what I am suggesting, to, again, heighten the intensity of need in this particular policy area.

Secretary MONIZ. But if I may add a bit more, because it is an area that I am very, very committed to.

Number one, the office, DNN, has been working on a kind of over-the-horizon piece of work. Today let's look at the threats going out and make sure we have got our program focused on the right threats.

But that is feeding into something that I charged the Secretary of Energy Advisory Board to look at, NN, and the directions, the threat space, et cetera. That is chaired by Al Carnasale, who you may know, is very highly respected in these areas.

And the task force will report at the end of the calendar year, although they will probably informally be able to provide some observations in the summertime, and be happy to get you——

Mr. FORTENBERRY. That would be helpful.

Secretary MONIZ [continuing]. Informed about that SEAB process.

Mr. FORTENBERRY. That would be very helpful.

Mr. Chairman, one other question right quick regarding the EDR project. We had an extensive hearing on this last week or so.

It seems to me, by our proposed reductions in terms of our contribution, it is an admission that the chaotic management of that

international effort is a very significant problem. And what I don't want to see is us 2, 3 years from now having spent even more money on this saying that it is going to go into cold storage.

It is unclear to me whether or not the proposed trajectory of some actual physical product is real. And, again, if we are going to end up wasting money in 2 to 3 years, is it necessary to decelerate this now?

Secretary MONIZ. Sir, I am recused from discussions about the whole fusion program. But the Acting Director of the Office of Science is here and could answer your question, if you would—the chairman permits.

Mr. SIMPSON. That is fine with me.

Mr. FORTENBERRY. Okay.

Secretary MONIZ. This is Pat Dehmer.

Ms. DEHMER. We talked about this last week when I was here.

Mr. FORTENBERRY. It is always fun to reemphasize things.

Ms. DEHMER. Isn't it? Yeah.

And my answer is going to be the same, obviously. We are waiting for the International Organization to derive a baseline for the project. That won't happen until a year from this coming summer, June, July 2015. And we are going to reassess a year at a time now.

The $150 million for this year we believe is the correct amount. We believe that maintaining our commitment to the joint implementing agreement is the right thing to do. So taking everything into consideration, the $150 million for this year is the correct amount. And we are going to watch very carefully what happens in the future.

Mr. FORTENBERRY. One idea that I thought of after your testimony last week: Instead of having some sort of annual review, what if we broke that up into even more micro tranches and looked at it quarterly to see if there is reasonable management initiative that brings about the reorganization that gives us some higher level of certainty that we are going to produce a product here that is worth the investment of taxpayer dollars?

Ms. DEHMER. Well, we certainly do watch what the International Organization, the IO, is doing on a more frequent than an annual basis.

So right now they have the management assessment in front of them. They have committed to look at all the recommendations.

What I am looking for is that they accept all the recommendations, they make a corrective action plan, and they implement it. And we will be watching that much more frequently than annually.

Mr. FORTENBERRY. Back to the question of priorities that we just talked about with the Secretary, if we are looking at the creation of a star and we are not exactly sure whether or not we can do that and we are pouring lots and lots of money into it versus trying to prevent the explosion of a nuclear weapon in an American city, there is a difference in priorities there.

Ms. DEHMER. I understand.

Mr. FORTENBERRY. Thank you, Mr. Chairman.

Mr. SIMPSON. Thank you. I thought I heard that question—or that answer last week.

Let me ask you again—get back into the subject that a few people have mentioned and you have responded to to some degree.

First, you get criticized for not being careful that you don't jump into a project that we are going to put in cold storage down the road. Then you get criticized for putting a project in cold storage when it is down the road.

It is one of the frustrations I have, I guess, here. You know, I look at, what, $14, $15 billion we spent drilling a hole in the ground in Nevada that is, I guess, a good place to store their records, in a hole in the ground. $3.2 billion we have spent so far on MOX.

We had a debate in Congress on whether MOX was the right thing to do, and there were Members of Congress opposed to it and Members of Congress supportive of it.

Chairman Hobson was very critical of MOX. He tried to kill it several times while he was chairman of this committee. But, nevertheless, Congress went ahead with it.

Yeah, it has had cost overruns. You could say that is true of the waste treatment plant in Hanford, also. We did MOX for a purpose, and we had an agreement with Russia. And now we are putting it in, what, cold standby status or whatever?

Secretary MONIZ. Uh-huh.

Mr. SIMPSON. It is not just that we are going to put this in—I mean, everybody is going to stop working there for a while because there is no money to continue the construction.

There are facilities all around the country, contractors that work to provide the services for the MOX project. All of those go on standby, if you will.

There is a cost of maintaining this in a standby status, and then there is a cost if it is one of the choices that you choose to go ahead with MOX in restarting it.

Secretary MONIZ. Uh-huh.

Mr. SIMPSON. And there is the potential loss of those contractors who no longer want to deal with the Federal Government or have lost employees.

I am thinking of a couple of companies that I am well aware of that are providing facilities that have to have welders that are certified to work on nuclear processes. They are going to go because they don't have any more work anymore. So there is a cost of restarting it.

Is it wise to put it in cold standby and incur those costs while you are deciding what you want to do or should we go ahead with it while you decide what you want to do? There are costs both ways.

Secretary MONIZ. Uh-huh. Yes. And, obviously, we have made the choice of going to the standby, recognizing the issues that you have said.

In doing that, we will be looking at how we can, in some sense, soften the blow in terms of some of the skills, because putting it into standby is not itself a simple action. It requires highly technical people, but, obviously, a reduced number to go there.

So, you know, it is a judgment on optionality in terms of—you know, if in a year or a year and a half one decides that MOX is not the way to go, then there would be the issue of having spent

another hundreds of millions of dollars on a project, but there are the downsides the other way. You know, I think those are facts.

The other constraint, of course, was the 050 cap. And so, you know, I have to say that was part of reaching the decision on that balance of issues——

Mr. SIMPSON. Sure.

Secretary MONIZ [continuing]. Because there is a difference there of, you know, maybe $300 million.

So this is not an easy—not an easy decision. It is not something that, you know, was a lot of fun. But we drilled down and we said, during Mr. Graves'—I mean, the life cycle cost, the question is: Is the country prepared to spend, you know, a better part of a billion dollars a year for decades?

Mr. SIMPSON. Where did the life cycle cost of $30 billion come from? Because I have heard substantially different numbers.

Secretary MONIZ. Well, what I would say is the—first of all, that is part of our internal team, as I mentioned, under the leadership of one of the people I recruited who had substantial private-sector management in project and investment history.

The GAO came out with a report recently that talked about 24 or 25 billion, but said it is almost certainly light. In fact, they had not incorporated certain issues. So I would say they are in the same place.

And the Army Corps of Engineers we also brought in to look at the capital facility and they, if anything, are probably a little bit higher than we are on it. So I just think right now all the information points to that being probably pretty much correct.

The other thing is that the team that we put together starting last June has worked intensively with the contractors, looking for ways to reduce costs and, frankly, other ways of sharing risk, maybe a different contract structure for part of the project.

And those have been very, very professional discussions that went on for a long time. We came out of the discussions, however, not seeing any reason to think that the cost estimate was in any way incorrect.

Mr. SIMPSON. Well, you said you are looking at four different options, a couple of them probably as expensive as MOX, a couple of them, I assume, less expensive than MOX.

Will those meet the Russian agreement?

Secretary MONIZ. Not presently.

Mr. SIMPSON. So you are going to have to renegotiate with Russia?

Secretary MONIZ. That would have to be a discussion with the Russians. Correct.

Mr. SIMPSON. That will be interesting.

Secretary MONIZ. I did have a couple of discussions with them earlier on. Of course, this was before decisions were made. But those were not in the recent months, shall we say.

Mr. SIMPSON. Let's talk for just a minute——

Secretary MONIZ. Well, actually, for the record, I want to make sure that I don't provide any misinformation.

I have not had any discussions with them in recent times about, you know, the decision and the need to maybe—the possible need to rediscuss this.

But just for the record, I want to make sure that I—I did as a courtesy inform just prior to the budget being public—inform the ambassador that this was going forward and that, when a dialogue is possible, we may need a dialogue.

Mr. SIMPSON. Okay.

Secretary MONIZ. Yeah.

Mr. SIMPSON. SMRs. Did the B&W announcement concern you? And what does it do to the future of SMRs? And the reason we build, do the research in building SMRs, or anything else, actually, is because there is a private-sector interest and a potential commercial interest in doing those things.

If B&W is having trouble finding that private-sector interest, does that concern you about the future of SMRs, in general?

Secretary MONIZ. To a certain extent.

But the other side of the coin is—and this was prior to the most recent B&W statement—and I should say we are—not surprisingly, we are in an intensive dialogue with them right now in terms of the path forward, as well as, by the way, going along very well is the discussion with the second awardee, Nv Scale.

But the other side of the coin is last month, for example, I had discussions with some major utility CEOs who historically have had interest in nuclear, and I asked them flat out, you know, "Look, is this a technology that is of any interest to you?" And the answer was uniformly, "Yes."

And the timing is critical. What they said is that, you know, "In the 2025 time period is when we have to make decisions about this." And this is certainly a player in those discussions, which is why that is—the critical thing is in the program as we had put forward. It was to get the kind of generic design application to NRC within years and to have a first plant of each design built prior to 2025.

So the timing looks to be just about right to hit that market point, and that is why, frankly, an announcement for any substantial deferral does trouble me because I didn't want to miss the market. So——

Mr. SIMPSON. Just one other subject is USEC and what is going to happen there. As you know, in last year's conference report, we included $62 million to keep it operating in the research and development agreement through April of this year.

Secretary MONIZ. Uh-huh.

Mr. SIMPSON. Plus another $56.6 million of transfer authority available after we approve a path forward for domestic enrichment technologies for national security needs.

Do you still believe there is a national security need for domestic enrichment?

Secretary MONIZ. I do.

Mr. SIMPSON. Mid-April is approaching relatively rapidly. Have you made a decision yet on what you are going to do in operating—what you said earlier. It would be nice to keep the—what is the name?—spinning——

Secretary MONIZ. The machines.

Mr. SIMPSON. The machines spinning. Yeah. Right.

Have you had discussions with USEC on what they will do, because, if they are, in fact, as you know, in mid-April going to be

running out of money, they are going to have to send out layoff notices to their employees.

Have you had those discussions with them so that they know what is going on so that their employees will know what is going on or are we looking at transferring $10 million to them to get them through that month of April—or that period?

Secretary MONIZ. So we are executing the program as it was laid out. And, again, just to repeat, that the technical milestones were all met in terms of the performance of the centrifuges.

Mr. SIMPSON. Right.

Secretary MONIZ. We are, number one, as I said earlier, looking at the reprogramming to get that $56 or $57 million to continue with the facility. We are committed to continuing that technology development, but we cannot be, you know, committed to a specific manager.

And so our current plan—and this is understood—is that the responsibility for managing it will novate to Oak Ridge, which is where the technology originated.

But, you know, I think it is quite reasonable to speculate that, of course, the skilled workforce working on those machines will then have to be kept on one way or another, probably—if I had to guess—and this is strictly a guess—through like a subcontract, for example, to USEC through them.

Mr. SIMPSON. Uh-huh.

Secretary MONIZ. Now, that is separate from the rest of the company's challenges. We all know they are in Chapter 11 at the moment.

And, you know, the whole uranium enrichment business is quite different. In fact, to be honest, you know, the ACP was being developed by USEC because it has a commercial opportunity.

Well, I think nobody believes right now that there is any room in that market for a new commercial opportunity. So we have to put our focus now on the national security obligations as opposed to the commercial world.

But, of course, if we keep the technology going for national security purposes and the uranium markets are quite different, nuclear comes back on, you know, the Japanese restart some reactors and other builds come on, well, then, maybe in the future that could then be commercially viable.

Mr. SIMPSON. Do you expect it to be run cheaper by the national lab than you do by the company?

Secretary MONIZ. I think that, for this particular task, it is really about maintaining the technology and the IP, which is what we are focusing on right now.

And then, if the commitment is made to go to a full national security train, then that would require manufacturing more. And there is a supply chain out there which, of course, USEC was drawing upon.

Mr. SIMPSON. Okay. Ms. Kaptur.

Ms. KAPTUR. Thank you.

I want to associate myself with your remarks, Mr. Chairman, and, also, point out, again, each of us exist in a different universe sometimes.

But in terms of USEC and Ohio, the highest unemployment counties are those counties in which it has its major operation. So I just wanted to put that on the table.

I think, Mr. Secretary, you are so important and your department is so important in America's future. I always like to cast my remarks in the broadest frame.

And I began earlier today with some statistics about how significant our energy deficit has been for a number of years and linking that to our vehicular deficit using the figure of $2.3 trillion in the red since—in the last decade.

If I were to go back and say how far are we in the red in terms of our energy dependence, our imports, back to 1973, it would be $5.1 trillion, $5.1 trillion more imports than exports, no balance. And if we were to add to that our vehicular imbalance, it would more than double. We would we would be well over $10 trillion.

We look at our budget deficit and we all have views of why we have a budget deficit. But, honestly, when you are hemorrhaging on the trade accounts a half a trillion dollars a year, led by energy and vehicle imports, it becomes pretty clear what has happened to the diminishment of economic growth in our country.

Right now, we have over 10.5 million Americans still unemployed, many working full-time for poverty wages and people who literally have dropped out. They have just dropped out. And they are in those counties where USEC functions right now, and they are in hundreds of other places around this country.

So the broad frame we operate in as a country is: How are we all going to work together to pull this team forward using energy and its infinite capacity to lead us forward to help heal this wound so that we don't throttle economic growth anymore in this country and that we are able to unleash the power of this economy again? And we are seriously challenged in that regard.

Now, I wanted to say one of the sectors that has not been hemorrhaging is agriculture, and there is a whole substructure in our economy that makes their success possible. So we have success stories amid the red ink. And we need to think about: Why does that happen? What is that structure?

And I wanted to say to you, Mr. Secretary, you have the vision to work with other departments, Department of Defense, Department of Agriculture. And so my next question will relate to some of these relationships that you have built, important ones, and particularly focused with the Department of Agriculture.

With the pressures of climate change, which are real in every part of this country, our growing western water shortages, which one Senator from California has described to me as California becoming a desert, with the increasing cost of transporting food across this country, how can the Department of Energy, through your incredible research facilities, contribute to the redesign of new energy and water-efficient, climate-controlled, canopy-under-canopy production and develop food platforms targeted to regions that have abundant fresh water, where the agricultural base has the capacity to innovate and adapt this new technology for four-season production?

I think we are at the beginning of a revolution in agriculture in this country because of climate change. And for those regions that

have the capacity to produce undercover, I find these structures completely 19th century. Now, their sellers will say, "Oh, Congresswoman, that is an overstatement."

But I have greenhouse producers I represent using 1946 boilers. We don't have solar technologies integrated in our canopies. And, frankly, we don't have cost-effective canopy-under-canopy production. We do not have systems that ration water, use it most efficiently and are able to integrate the energy and water demands of modern food production.

Can you give us some insight in the kinds of relationships you have with the Department of Agriculture? And could the two of you together, these two massive departments, one of which produces trade surpluses and the other one which produces trade deficits, put your mind together to help America heal this major wound that we are facing with these trade deficits?

Secretary MONIZ. I would only quibble with our causing trade deficits. We are trying to reduce the trade deficits.

Ms. KAPTUR. That is good to hear. But it is so slow, Mr. Secretary. 40 years. How long has your department been around? 1979, was it?

Secretary MONIZ. 1977.

Ms. KAPTUR. 1977. So think about this.

Secretary MONIZ. Right. So—well, it is interesting. First of all, let me say a few things that would touch on some of the areas that you mentioned individually and then maybe come back to more the system view.

Certainly, in terms of the water issues, we have ramped up an energy water nexus activity because we do think this is an increasing problem and, with warming, it will just keep getting worse.

And, in fact, part of the issue is the pattern, as long expected, which we seem to be seeing in front of us, is, roughly speaking, you know, dry places getting dryer and wet places getting wetter and neither is good——

Ms. KAPTUR. Yes. Correct.

Secretary MONIZ [continuing]. Because there are runoff problems with some of these intense storms, et cetera, et cetera. So that is one thing that we—and probably next year will be more visible in terms of what we want to do in terms of energy and water.

Cost of transporting food you mentioned. And I am sorry. This will be slow as well. But, for example, programs like the SuperTruck program that we have, just a few weeks ago, I stepped into the cab of the first—I wasn't allowed to drive it, but I stepped into the cab of the first product.

It was a combination of Cummins and Peterbilt in terms of a class 8—you know, class 8 vehicle, which had energy efficiency between 60 and 70 percent better than the standard class 8 vehicle.

All those technologies are not yet ready for commercial deployment, but I think over the next 10 years you will see them go out there. So big impact on that. And class 8 vehicles do use a lot of the transportation fuel in this country.

In terms of water-efficient food platforms, there, I think, you know, the—and I don't know—and, actually, Pat Dehmer could probably say more.

But in a general sense, things like the work of our Joint Genome Institute, part of that is looking for more, you know, water—or less water-tolerant plants, et cetera, for various applications. So those all are relevant.

But for the specific problem you mentioned, I am not aware of any kind of system approach that we have. That is something that I could talk with Secretary Vilsack about, potentially, in terms of a joint program.

Ms. KAPTUR. I thank you, Mr. Secretary, for hearing me. You always hear us. You are not able to change that flagship department that you run always so quickly, but I think just to have the insight of what is at stake here——

Secretary MONIZ. Uh-huh.

Ms. KAPTUR. And when I talked about the parts of the country that are enduring such difficult economic circumstances, the proper technology and training can lead to new industry in places that it doesn't currently exist, and I think your department, in cooperation with the Department of Agriculture, can really do some extraordinary development.

If I take a county like Cuyahoga County in Ohio, which has lost enormous capacity—they used to be the leading greenhouse-producing county in Ohio because it sits next to a great fresh water lake. With new technology, they could restore some of that production. The same is true next door in Lorain County, where U.S. Steel and Republic Steel function.

But that isn't all they can do. They have incredible landscape industries, the third—second largest growing sector in Ohio now in the agriculture front. But we haven't put the science together.

And for you to talk to the Department of Agriculture is a Washington miracle, that we would actually have two of these stovepipes talking to one another and thinking about creating the future, whether it is biofuels or, in this case, food-production platforms, which could also be, by the way, fish-production platforms, and thinking about ways of helping our greenhouse growers, for example, to produce woody plants much more efficiently than they are currently doing.

I haven't seen a single canopy platform that has solar embedded in the canopy itself. I am thinking: What is holding this industry up? Why are we functioning like the 19th century here? Why are we doing this?

Secretary MONIZ. I think the Dutch are quite advanced in these areas.

Ms. KAPTUR. The Dutch are very advanced, and the Belgians are very advanced. The problem is they have a cap-and-trade system in Europe that gives tremendous energy subsidies to their producers.

And I am very worried about this country and our inability to meet the water and energy challenge of their subsidy system versus ours in a sector, agriculture, in particular, that has provided a net positive to us in terms of our trade balance.

And I think the energy-water nexus—you mentioned genomics as well. I was at an Israeli seed facility. Unbelievable tomatoes they are producing there with limited water. Unbelievable.

We need to be as agile. And, unfortunately, I can tell you we are not. Even though the people out there are working very hard, they are working with old technology.

So I thank you very much for allowing me to place that on the record.

And could you, finally, Mr. Secretary, tell us a little bit more. As you look to the future for your advanced manufacturing initiative, lead us through the next year. What is the department looking for? What are you hoping for?

You have got cooperative agreements with the Department of Defense, with the Department of Agriculture. You have ideas about new technologies that you want to advance. Tell America what you hope to achieve in the next year in this critical field.

Secretary MONIZ. Well, once again, you know, the outcomes will be over several years, but what we want to get moving and have moved are—so far, we have done 2.4 of these manufacturing centers.

The .4 is in Ohio, where the Department of Defense is the larger investor to us. And then we have one in North Carolina right now and one that is open right now for competition.

But I think, first of all, the important thing is the theme here is to focus on the kind of cross-cutting, kind of enabling manufacturing technologies that will give broad advantage in the United States.

So the first one that we were involved in is on 3D printing and advancing the manufacturing technologies there. And I see Mr. Fleischmann is back. And I will mention, at Oak Ridge, there is also a focus on 3D printing, basically.

Secondly, a second one is wideband gap semiconductors. That is mainly for power electronics, which is—again, it is an enabling technology. It cuts across many energy sectors and other sectors.

The third that is now open for competition is on the whole subject of composite materials for lightness and strength. And I might add the Department of Defense has two others. One is on lightweight steels, metals, and the other on digital manufacturing.

So you can see the pattern is—these are not, you know, kind of pigeonhole things. They are key core capabilities that can go across our manufacturing sector and, hopefully, gain us advantage

Ms. KAPTUR. And for the sake of the public, either yourself or your director of science, could you state for the public which technologies, such as nanomaterials—what are your priorities? You have about six or seven.

Secretary MONIZ. For specific applications of these technologies? Is that what you mean?

Ms. KAPTUR. Well, the sectors, nanomaterials——

Secretary MONIZ. Oh.

Ms. KAPTUR. You have about six or seven major——

Secretary MONIZ. Yes. So the kinds of things that I already mentioned in terms of lightweight materials, composite materials, the lightweight metals, the manufacturing processes like 3D, et cetera.

So those are the priority areas now, and we will be expanding the list in consultation with a bunch of stakeholders.

But then the applications, if I just look at the energy space, you know, they range from efficient vehicles to wind turbine blades and power electronics, renewables to grid management.

So the applications of this is going to be very broad across the energy sector and other parts of our industrial sector, because, again, we are focusing on these key foundational technologies that will apply to many manufacturers.

Ms. KAPTUR. Thank you.

Thank you, Mr. Chairman.

Mr. SIMPSON. Mr. Nunnelee.

Mr. NUNNELEE. Thank you, Mr. Chairman.

Thank you for being here, Mr. Secretary.

Last year the President's budget request called for a strategic review of the Tennessee Valley Authority, which, to my knowledge and from testimony from the director of OMB in the budget committee on which I serve that the review is yet to be completed.

The President's fiscal year 2015 budget request states that, "The administration stands ready to work with Congress and TVA stakeholders to explore options to end Federal ties to TVA, including alternatives such as the transfer of ownership to state or local stakeholders."

So considering the very active partnership between TVA and NNSA—I am curious—what conversations have taken place between OMB and the Department of Energy and NNSA, specifically as it relates to tritium production?

Secretary MONIZ. As I understand, frankly, prior to my tenure, I believe that those discussions were held in terms of making sure that the national security equities would be part of any discussion that went forward.

Mr. NUNNELEE. So what are your thoughts on transferring tritium production to the private sector or to state or local stakeholders?

Secretary MONIZ. Well, we clearly need to continue our tritium production and—you know, and I would say, with TVA being a government entity, it is probably a little bit simpler. But I think, technically, of course, we could do it with a commercial reactor as well.

Mr. NUNNELEE. We will be——

Secretary MONIZ. I mean, commercial—it is a commercial reactor, but I mean a non-government entity.

Mr. NUNNELEE. Sure. We will be submitting questions as to what it would involve to make that transition, should it become necessary.

Secretary MONIZ. Okay.

Mr. NUNNELEE. Have I got time for another one, Mr. Chairman?

Mr. SIMPSON. You bet.

Mr. NUNNELEE. Thank you.

I do support your work in advanced research concepts. This subcommittee last year added $12 million to this program for 2014 to fund an industry-only competition for advanced reactor concepts.

I know the President's budget has not requested more funding for this. I do hope that Congress will be able to continue this in 2015 along with our support of the national lab efforts. We have to find ways to stimulate industry efforts to develop new reactors that will be safe and economically competitive.

Developing generic technologies like DOE did with this very small amount of 2013 funding will take a long time for us to get to where we need to go of competitively priced electricity.

But given the larger amount that we gave you in 2014, I hope that you will move forward in funding three or four reactor concepts that might eventually produce economically competitive electricity, not simply generic technologies that may end up not working well together.

So I would appreciate it if you would just look into this and get back with us on the subject.

Secretary MONIZ. I will, indeed.

Mr. NUNNELEE. All right.

Thank you, Mr. Chairman.

Secretary MONIZ. Thank you.

Mr. SIMPSON. Mr. Visclosky.

Mr. VISCLOSKY. Mr. Chairman, I would simply want to emphasize that I join with Mr. Hobson in his concerns about MOX originally. Thank you very much.

Mr. SIMPSON. I was going to mention you, but I wasn't certain that that is where you were.

Mr. VISCLOSKY. I appreciate the chairman not taking my name in vain. I appreciate that very much.

Mr. SIMPSON. Mr. Fleischmann.

Mr. FLEISCHMANN. Thank you, Mr. Chairman.

And, Mr. Secretary, I wanted to discuss high-speed computing because I think this is so critically important to our nation. And, as you know, when you visited ORNL with me, we had an opportunity to visit there and discuss that.

We are competing with the rest of the world in developing and maintaining our supercomputing capabilities, sir.

Can you talk a little bit about the importance of computing, both in speed and performance, and how you see the U.S. comparing with other countries.

Secretary MONIZ. Yes. Thank you for the question.

First of all, you can be assured that I am very, very committed to maintaining and extending DOE's—I mean, DOE and its predecessor agency's really historic role in helping push advanced computing for this country.

It was—when I was in my first go-round at DOE, the program was really pushed by our weapons program, which historically had been how these supercomputers were advanced over many decades.

At the end—towards the end of the Clinton Administration at the department, we started the application of these tools more broadly to key science and energy challenges.

And I have to say, coming back, I am really pleased to see how that has burgeoned, really, which reinforces your point about how high-performance computing, you know, is—kind of goes across so much of what we do, often without even realizing it, frankly, including the spread to industry that we all know, airline manufacturing, for example, being based on this.

And I will come to a broader statement. But, also, in fact, at Oak Ridge, again, I would mention the very first DOE hub, CASL, which is exactly on computer simulation for design of next-generation fuels and safety systems, et cetera, for nuclear power.

So I just think that the—this has been a huge edge. It is for us. It has been a huge edge also in the national security context. And, in fact, having the supply chain for cutting-edge competition has been very important for us.

So you mentioned speed. Well, right now we don't have the fastest computer in the world. Right now that is in China.

And the Chinese, the Japanese, the Europeans—everybody is really committing to this so-called Exascale push, which is why in this budget we have, I think, a $141 million request specifically to move Exascale, with $50 of that in NNSA and $91 in the Office of Science.

I do want to emphasize that it is not just about speed. That is important. But, frankly, understanding the architectures of these bigger and bigger machines, understanding how one writes the—let me call it, roughly speaking, software for utilizing this—I think, when you put it all together, I would say we are in the lead, but we won't stay there if we stand still.

So the road to Exascale—I mean, we see Exascale as, you know—maybe, let's say, the end of the decade or a year or two after that. But the road in getting there will have many discoveries that will, I think, permeate the bigger picture about developing and using these kinds of cutting-edge capabilities.

Mr. FLEISCHMANN. Okay. As a follow-up, you mentioned CASL, which I think is very important.

Could you please for the committee tie in how the supercomputing allows us and has benefited specifically the CASL program, to tie that in. I think it is very clear that supercomputing and CASL—it is a prime example of why we need this program.

Secretary MONIZ. Yes. So the CASL is the hub at Oak Ridge. It has got many partners, both other labs, academic. I might mention Idaho is part of that, in fact. Los Alamos as well. Universities are part of that.

Of course, Oak Ridge is one of our premier centers for high-performance computing. That is critical to the performance of CASL.

I would like to emphasize that CASL is pretty much at now its first 5-year installment. It has gotten very, very good reviews.

And it has provided products as promised that have gone out in terms of industry being able to adopt these tools. So I think it is a—you know, I think the program has received very, very positive reviews.

Mr. FLEISCHMANN. Mr. Chairman, do I have any more time remaining for a quick question?

Mr. SIMPSON. Quick one. Yes.

Mr. FLEISCHMANN. Just to show our competition internationally, Mr. Secretary, we have a commitment to supercomputing in this country.

But for the benefit of the subcommittee, where is the rest of the world in terms of their commitments?

Secretary MONIZ. Well, as I say, the Chinese, the Japanese and the Europeans, in particular, have a major commitment, probably in Russia, too, although I don't know as much about that, to be honest.

But I think, in terms of the competition, to understand the intensity, what I would say is that, you know, the Chinese in their—I

forget the exact number—but tens of petaFLOPS computer, the world's fastest at the moment, they have a lot of American-origin components in there.

However, it is well known that their plan going forward is that the next generation will have completely indigenous components. And so that is a change in the game.

Mr. FLEISCHMANN. Thank you, Mr. Chairman.

Thank you, Mr. Secretary. I yield back.

Mr. SIMPSON. Mr. Fortenberry.

Mr. FORTENBERRY. Mr. Secretary, I would like to pull back to a higher altitude and ask some more fundamental questions.

Is there a right to nuclear power?

Secretary MONIZ. The issue——

Mr. FORTENBERRY. Because—I think you can anticipate why I am asking this, because this has set, basically, the architecture in the way in which we deal in treaty obligations and in international relations with other countries.

And, yet, as we know, in certain types of nuclear power, it is a quick sprint when the other resource factors are there to nuclear weapons capability. And so we have this distinction that, again, lays a certain set of working premises, but then leads us to the potential for future problems that are very grave.

We have the world on the verge of nuclear weapons proliferation. That is the reality. If certain things don't go our way, you can see this happen in the Middle East. If other countries get shaky in terms of their agreements with us, they have advanced economies and scientific capacity to develop this quickly.

So the reason I am asking you this is related back to our earlier question regarding the strategic thinking—the robust strategic thinking, the interdisciplinary strategic thinking, between us and the administration.

How do we reexamine some of these working premises? And then maybe outcomes flow from there—or at this point probably what would seem like an impossible policy idea of, like, for instance, an international nuclear fuel bank where you can actually get ahold of the inventory of nuclear material that is in the world and work toward, again, stability in this arena, whereas right now we are on the verge of grave instability.

Secretary MONIZ. In terms of your opening statement about our right to nuclear power, I think—well, of course, going all the way back to President Eisenhower's Atoms For Peace, I mean, there was the idea that, of course, we would support and welcome the spread of nuclear power with the appropriate conditions. And today that largely means, for example, IAEA safeguards, et cetera.

The second point, of course, is that, just to emphasize, as you well know, the nuclear power reactor, I would say, is not in and of itself their proliferation—the center of the proliferation risk as opposed to other fuel cycle activities that might surround it, which is why, of course, we have the strong focus on the——

Mr. FORTENBERRY. Well, that is why I said——

Secretary MONIZ [continuing]. Materials.

Mr. FORTENBERRY [continuing]. Certain types of nuclear power generation.

Secretary MONIZ. That is right. Yeah.

So, look, I think the—I think we have effective programs with the IAEA. We support the IAEA quite strongly. I might add the IAEA—and I was at the first ministerial meeting last June—I think it was last June—or—no—well, I don't know. Anyway, I think it was last June. They had the first energy ministerial meeting on nuclear security.

So I think this is very, very important, that the IAEA is elevating organizationally and in terms of focus security, in some sense, to the same level of safety, which has been traditionally their focus.

Mr. FORTENBERRY. That is a great point. If I could interrupt, that is an excellent point.

And I think it puts us on the trajectory toward trying to re-create a policy framework that diminishes the possibility of further proliferation.

That international agency, I think, has an excellent director, and it is my hope that they are robustly supported not only by us, but around the world.

Secretary MONIZ. Yeah. If I mention that as a factoid, then the—as I mentioned, last week was the third of the nuclear security summits that President Obama started in 2010. Then it went to South Korea, then The Hague.

2016 that will return to the United States, and later—probably 6 months later would be the second IAEA energy security—nuclear security ministerial, with the idea that that may be then an institutionalized way of carrying forward this discussion at a high level.

Mr. FORTENBERRY. Yeah. That, I agree, is also another very important platform. In fact, I was at the first one that the President held.

A group of us from Congress went on the bus over there, and we could not figure out the common thread between us. It was the most diverse group of members on a single bus I have ever seen.

And, finally, I think, now-Senator Markey mentioned to me, "Have you figured out why we are all on this bus?" I said, "I cannot." He said, "It is everyone who voted against the U.S.-India civil nuclear trade deal." Because we had concerns about the nuclear proliferation treaty dynamic.

Secretary MONIZ. I see.

Mr. FORTENBERRY. And—but, yes, I think that is another platform that is very important, and it is achievable.

The other ideas that I have suggested are, again, shifts of paradigm in thinking, but—and maybe the IAEA is the right agency or the place where a broader movement in terms of nuclear security—standardization of nuclear security can occur.

But this is the kind of—again, we don't have a lot of time here. I mean, project out where we are going to be in 2030 and this could go either way.

Secretary MONIZ. Uh-huh.

Mr. FORTENBERRY. Yeah.

Thank you, Mr. Chair.

Secretary MONIZ. Yeah.

Mr. SIMPSON. Ms. Kaptur, did you have any further questions?

Ms. KAPTUR. Just very quickly. Thank you, Mr. Chairman, very much.

I just wanted to mention to the Secretary that I don't know if the department has done any evaluation of the impact of the Chinese dumping of solar panels on the global market, I had mentioned this in prior years.

But the intellectual property that exists in many smaller companies, certainly in my region, I think is important to the country.

And I would just direct your attention to what has happened, the fallout of those actions by the Chinese across the globe and certainly within our own country and our own innovation platforms that exist. So I wanted to just bring that to your attention.

And then, secondly, I believe that, in regions such as I represent, there is a tectonic shift going on in power and the production of power and the confluence of the, as I mentioned earlier, shutdown of coal-fired utilities, the nuclear industry that is—many plants up for relicensing at the same time as new natural gas discoveries are coming on board.

And I don't really know what that means for unregulated states versus regulated states, but I would hope that the department—if there is a Federal role for us to play for those regions that are undergoing significant change, that there would be—are we just going to let companies die?

I guess that is what the capitalistic system is all about, but I would just have to say that, for unregulated markets and merchant economies, these transitions can be really brutal.

And so I would ask you, if you can give us any guidance of actions we could take to provide smoother transitions, it would be very instructive to us.

So I thank the chairman very much.

I don't know if the Secretary wishes to comment on either the solar issue or the changing nature of power production in some of our regions, but I would welcome his comments.

Secretary MONIZ. Well, on the solar issue, I would just mention, of course, that our trade representative, Mike Froman, who—we have launched two WTO actions on solar from China. So those are in process.

On the second, I would just mention—this is no simple issue—we certainly have been—for example, the nuclear closures we have been certainly looking at, but, you know—and we have had discussions with some of the companies.

We don't have a lot of authorities in that regard. I think a lot of those issues would be at a state level and a state regulatory issue.

And I think one of the issues is to what extent—and it is different in different regulatory structures—to what extent is fuel diversity, for example, you know, kind of valued in terms of how one is moving forward.

But I would note that, again, one of our major efforts is this—I referred to earlier the Quadrennial Energy Review. That is a process which—this year. It is administration-wide. DOE has a special role with our analytical capacity and this new office we created.

The focus for this year is specifically on energy infrastructure, transportation, storage and distribution of energy, electricity and

fuels. And it is clear that one of the focal areas is going to be a set of regional fuel resiliency studies.

That, of course, couples directly into this issue of fuel diversity because—for example, in my part of the country, New England, it is well known that there is—especially in the winter when it got very cold—there is a real mismatch of natural gas transport capacity into a region that has become very natural gas-heavy in the power sector.

But, of course, we also had issues with propane certainly in the upper Midwest, other parts of the country, too, in fact, even in the South, but especially in the upper Midwest where we had terrible propane problems, a lot of infrastructure issues. There became an enormous differential of price between propane at the Kansas and Texas hubs because it was an infrastructure bottleneck issue.

So we are going to be looking at that and looking at it also on a regional basis, and I think that can at least provide a foundation for the issue you are talking about.

Ms. KAPTUR. Thank you.

Thank you very much, Mr. Chairman.

Mr. SIMPSON. Thank you, Mr. Secretary, for being here today. We have taken about two and a half hours of your time. So I appreciate you sitting there throughout that and answering our questions.

You obviously are in charge of a very important department, in my opinion. That is why I was so excited to become chairman of this subcommittee, because I think the Department of Energy is truly both wide-ranging and important to the economic future of this country in a variety of ways that we have talked about today. You face many challenges, obviously.

My job is not only to do the appropriation for the energy and water appropriations bill, but it is to help make you the most successful secretary of the Department of Energy that we have had.

Secretary MONIZ. Thank you.

Mr. SIMPSON. When that happens, then we all win.

Secretary MONIZ. We all win. Right.

Mr. SIMPSON. So I look forward to working with you over the coming months as we put together this budget and try to address both the concerns that you have and the concerns that have been expressed here by members of this committee and try to address the future.

Secretary MONIZ. Good. Thank you, Mr. Chairman.

Mr. SIMPSON. Thank you.

Secretary MONIZ. Thank all the members who provided very helpful questions today.

Mr. SIMPSON. You bet. Thank you. We are adjourned.

QUESTIONS FOR THE RECORD

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
HOUSE COMMITTEE ON APPROPRIATIONS

DEPARTMENT OF ENERGY

FISCAL YEAR 2015 BUDGET HEARING

APRIL 2, 2014

PROGRAM AND PROJECT MANAGEMENT

LABORATORY COMMISSION

Subcommittee. Mr. Secretary, the fiscal year 2014 bill includes a provision to establish a commission to investigate the effectiveness of the Department of Energy's national laboratories to meet their missions. You've also reestablished and tasked a Secretarial Advisory Board (SEAB) to get to work on a similar mandate.

What is the status of the laboratory commission's work?

Secretary Moniz. As you know, the Department must appoint 9 members to the Commission from a list of 18 persons nominated by the President's Council of Advisors on Science and Technology (PCAST). As of the date of this response, I am actively evaluating prospective candidates, including determining both the availability and the potential conflicts of interest among them.

Subcommittee. How will you integrate the work of the commission with your advisory board and other groups that are looking at similar issues?

Secretary Moniz. I have established an Office of Secretarial Boards and Councils within the Office of the Secretary to coordinate the work of the National Laboratory Policy Council (LPC), the Secretary of Energy Advisory Board (SEAB), and other boards/councils. The various groups receive regular status updates to ensure the transparency of ongoing efforts and to optimize their complementarity. Where appropriate, one body may refer an issue to another for consideration. As you know, the focus of the Commission is defined in the statute. While the Commission and SEAB may look at similar or related issues, as one of its charges, I plan to ask SEAB to remain informed about the deliberations of the Commission regarding the DOE Laboratories and once the Commission reports, to provide me their views about the Commission's findings and recommendations.

Subcommittee. What do you hope to get out of all of these reviews?

Secretary Moniz. Ultimately, I seek to strengthen the relationship between the Department and its National Laboratories and to reinforce the enterprise-wide view of the National Laboratory system; to receive expert outside advice on topics of importance to the Department and its labs; and to have access to a broader base of information and analysis from which to make informed decisions.

THE PROLIFERATION OF CENTERS ACROSS THE DEPARTMENT

Subcommittee. Mr. Secretary, over the years this subcommittee has discussed how the Department seems to be getting bogged down with far too many centers of various kinds. Some of the recent proposals from the Department include BioEnergy Research Centers, Energy Innovation Hubs, Energy Frontier Research Centers, Manufacturing Demonstration Facilities, and National Network for Manufacturing Innovation Institutes, just to name a few. I'd like to take a moment to delve into this topic.

By my count, in fiscal year 2009 this subcommittee appropriated $175 million for these centers. Last year's omnibus appropriations bill, on the other hand, increased that level of funding to $339 million. That's a 94 percent increase over 5 years. This year's budget request continues that trend and proposes $449 million for centers. That's a 156 percent increase from fiscal year 2009. It also represents nearly 5 percent of the Department's entire Energy Programs budget.

Mr. Secretary, one of the major concerns of this subcommittee is unfunded liability. With the proposals in this request, which fund most centers for five-year terms, the Department would mortgage nearly $800 million in future-year appropriations beyond fiscal year 2015. To be clear, that's fiscal year 2016 money and beyond that we would be spending.

How do you suggest this subcommittee approach these out-year commitments, and is there a way you might suggest limiting as much as possible the unfunded liability associated with these centers?

Secretary Moniz. Non-permanent centers can be a very effective approach to larger R&D projects for a number of reasons: 1) when the Department proposes a new center or portfolio of centers, we tailor its size to the nature of the scientific/technical challenge to be addressed; solving some problems can strongly benefit from a large, multidisciplinary "team" approach; 2) the Department can attract the best ideas through openly competed solicitations that prompt the scientific/technical community to "self-assemble" into highly functional teams; 3) the Department possesses the flexibility to modify the scope and duration of any non-permanent center based on its performance (for example, after a recent review of the Energy Frontier Research Centers, some funding was reallocated to the highest-

performing centers). Thus, non-permanent centers may be terminated or modified for lack of performance or lack of available funding.

Within EERE, the Department is seeking to limit unfunded outyear commitments for new non-permanent centers. Forward funding, as an element of a comprehensive project management system, can help enable greater cost control and can facilitate more favorable cost sharing arrangements. For example, in FY 2014, EERE is currently planning for three Clean Energy Manufacturing Innovation Institutes, including the Next Generation Power Electronics Manufacturing Institute and the Advanced Composites Manufacturing Innovation Institute. A Request for Information for potential topics for the third Institute was released in April 2014. The 2015 Budget request for the Advanced Manufacturing Office forward funds at least this third, new Institute and the pay-down of commitments to the other two established Institutes.

Subcommittee. In attempting to understand the various sorts of centers the Department has proposed, can you explain what makes something a hub versus a center versus an institute? Is it the amount of funding it receives, or how it's organized, or how it's overseen by the Department? How are they different from one another?

Secretary Moniz. The scale, program management philosophy, and team composition of each of these research programs is tailored to suit the particular innovation challenge it addresses. Last year I charged the Secretary of Energy Advisory Board to conduct a study of the Department's newest constructs for funding energy R&D: the Bioenergy Research Centers, the Energy Frontier Research Centers, ARPA-E, and the Energy Innovation Hubs. In my charge I asked SEAB to address the following questions:

- Is this suite of management and funding mechanisms proving effective? Are they complementary?
- Are there gaps in the DOE approach to energy, science, technology innovation and impact on industry development and deployment?
- Is the DOE effectively drawing on the resources of the labs, academia and industry, including entrepreneurial startups?

SEAB released their report on March 28; the report contains a succinct summary of the differences between these research modalities. SEAB affirmed the distinct character of each modality and pointed out each's strengths and, where applicable, potential shortfalls. SEAB made a number of recommendations regarding these programs to which I will give serious consideration. The report is available for download on the SEAB webpage hosted at energy.gov.

ENERGY EXPORTS AND THE GEOPOLITICAL CONTEXT

Subcommittee. Mr. Secretary, the ongoing crisis in Ukraine has brought to the fore how exporting U.S. energy to our allies can serve our geopolitical interests, as well as create jobs here at home. But well before the Russian claim to Crimea, this subcommittee has been supportive of a clearly communicated, timely response to make an appropriate determination on each of the pending applications. In fact, last year's House report included a directive for the Department to submit a report within 30 days on its plan to finish consideration of all applications filed with the Department.

Mr. Secretary, when can we expect to see that report?

Secretary Moniz. The Department is processing the pending applications to export liquefied natural gas to non-free trade agreement countries on a case-by-case basis as expeditiously as possible. The orders on export applications are complex documents that must withstand public and legal scrutiny. In December 2012, the Department established an order of precedence to evaluate pending applications to export liquefied natural gas to non-free trade agreement countries based in part on the date that the application was filed and in part on whether the Federal Energy Regulatory Commission had authorized the pre-filing environmental review of the related liquefaction project. The Department is currently working on the report and is committed to transmitting the report to Congress as expeditiously as possible.

Subcommittee. Last week during his trip to Brussels, President Obama said a new transatlantic trade pact with the European Union, now under negotiation, would make it easier for the United States to license more gas exports.

Mr. Secretary, are you aware of any ongoing discussions between the Administration and the European Union to relax restrictions on exports of U.S. gas?

Can you discuss the more general issue of exporting U.S. energy abroad? What is the Administration's stance on the issue, and what role is the Department of Energy playing in conjunction with other federal organizations?

Secretary Moniz. The Transatlantic Trade and Investment Partnership (TTIP) agreement is presently being negotiated between the United States and the European Union. The key objectives of these free trade agreement negotiations include improved access to EU markets for U.S. products, investment, and services which would benefit U.S. manufacturers, investors and service providers including those in the energy sector and facilitate the participation of U.S. companies in the development of energy resources in other countries.

With respect to the way that new free trade agreement (FTA) countries including EU countries, may be considered relative to existing and pending authorizations for liquefied natural gas (LNG) exports, if the United States enters into new FTAs that require national treatment for trade in natural gas, under the Natural Gas Act exports to such new FTA countries will be deemed to be in the public interest. Existing authorizations to export to current and future FTA countries will not need to be amended in order to make such a change effective. As of April 22, DOE has approved 35 long-term applications to export lower-48 LNG to FTA countries – 2 are currently pending. The first project to export U.S. produced LNG is not expected to come online until late 2015.

Private companies, not DOE, make the decisions about the foreign parties with whom they wish to enter into commercial LNG transactions. Companies interested in purchasing U.S. produced LNG should contact the private sector entities holding or applying for U.S. export authorizations.

Subcommittee. I assume the Administration is considering all of the tools at its disposal to support our European allies and deter the aggressive acts by Russia's move into the Crimea. Are any Department of Energy activities or assets, such as the Strategic Petroleum Reserve, being considered as potential tools?

If so, under what circumstances might you consider employing any of these potential tools?

Secretary Moniz. The Administration is considering all possible tools to support our European allies during this situation. Releases from the Strategic Petroleum Reserve can be authorized by the President under his authority under the Energy Policy and Conservation Act (1975).

DOE REORGANIZATION AND CROSS-CUTTING INITIATIVES

Subcommittee. Mr. Secretary, several months ago you began implementing a broad reorganization plan across the Department. One of the first steps in this process was to bring together the management of the Department's science and energy programs to more closely integrate the "innovation chain", as you describe it, from basic science to applied research to technology demonstration and, ultimately, to commercial deployment.

Can you describe for us how that reorganization is going, and what concrete improvements do you anticipate from them?

Secretary Moniz. The Department reorganized its Under Secretariats in July 2013. The Under Secretariat for Science and Under Secretariat for Energy were merged into a single Office of the Under Secretary for Science and Energy (S4), and a new Office of the Under Secretary for Management and Performance (S3) was created. The two Under Secretary nominees have yet to be confirmed, but the Deputy Under Secretary positions in both offices were filled by September 2013, and both Under Secretariats are making progress on a number of fronts.

S4 plays a critical role in the management and strategic oversight of the Department's basic science and applied energy missions. By more closely aligning activities along the research continuum, our energy enterprise will be better positioned to confront the nation's economic, environmental and security challenges.

Specifically, S4 has been charged with improving coordination of the Department's basic and applied research and development, technology demonstration, and technology transfer and deployment activities. Early success in program coordination is represented by a series of budget crosscuts proposed in the FY2015 request in high priority areas such as Grid Modernization and Subsurface Engineering. The model of crosscutting budget proposals, developed under the aegis of the S4 office, will boost efficiency, reduce duplication and leverage complementarity across program investments to form the backbone of the Department's coordinated approach to science and energy investment.

Importantly, both S3 and S4 are working to better integrate the National Laboratories into the Department's planning processes and improve the

effectiveness of laboratory performance management. Improved engagement with the Labs is a top priority.

Subcommittee. Consolidating these programs under one management structure seems to have spurred several cross-cutting initiatives that span multiples offices and agencies within the Department. Exascale computing, grid integration, and supercritical transformational electric power generation are a few that come to mind. Can you discuss the cross-cutting initiatives in your fiscal year 2015 request, how they came about, and how these technologies have multiple applications within your energy programs?

Secretary Moniz. The FY 2015 budget crosscuts are the result of my focus on improved coordination of the Department's basic and applied research and development, technology demonstration, and technology transfer and deployment activities. Crosscutting teams of technical and budget professionals were formed around high priority areas, and these teams were asked to collaboratively address common objectives through a multi-program budget lens.

The Grid Modernization crosscut tackles the challenges of an electricity system that needs to be affordable and reliable, secure and resilient, and clean and efficient. The coordination of major program lines across the Office of Electricity Delivery and Energy Reliability and Office of Energy Efficiency and Renewable Energy R&D portfolios is necessary to maximize taxpayer dollars invested in developing tools and capabilities to enable the grid to better support the nation's diverse energy demands and generation portfolios that are evolving in uncertain ways, and to accommodate regional differences in needs, goals, and available resources. This requires collaboration among states, utilities, regulatory agencies, consumer groups, and federal agencies. Institutional support funding for outreach and engagement of these varied actors is featured prominently in the crosscut through funding requests in the Offices of Energy Policy and Systems Analysis and Intergovernmental and External Affairs.

Another important crosscut was formed around Subsurface Technology and Engineering. Subsurface energy sources currently satisfy over 80 percent of total U.S. energy needs. Finding and effectively exploiting these resources while mitigating impacts of their use constitute major technical challenges. For example, the subsurface can potentially provide hundreds of years of safe storage capacity for carbon dioxide (CO2), and opportunities for

environmentally responsible management and disposal of hazardous materials and other energy waste streams. The subsurface can also serve as a direct source of power in the form of geothermal heat and even a reservoir for energy storage for power. The Subsurface crosscut addresses the following key challenges to optimize energy production, energy/CO2 storage, and waste storage/disposal:

- *Discovering, characterizing, and predicting*: Efficiently and accurately locating target subsurface geologic environments and quantitatively inferring their evolution under future engineered conditions;
- *Accessing*: Safe and cost-effective access to the subsurface with properly managed reservoir integrity;
- *Engineering*: Creating/constructing the desired conditions in challenging high-pressure/high-temperature environments;
- *Sustaining*: Maintaining these conditions over multi-decadal or longer time frames throughout complex system evolution; and
- *Monitoring*: Improving observational methods and advancing understanding of the microscopic basis of macroscopic complexity throughout system lifetimes.

The evolution of the FY15 Supercritical CO2 (sCO2) crosscutting initiative is in response to growing interest in this technology and the identification of opportunities to further develop sCO2 technology. The sCO2 Brayton Cycle energy conversion system is an innovative concept for converting thermal energy to electrical energy and applies to several of the Department's programs, including Nuclear, Efficiency and Renewables, and Fossil Energy. It has the potential to reach greater efficiencies than the traditional Rankine cycle, especially as higher temperature heat sources are used for electricity generation. The implications of a significantly higher-efficiency power cycle are immense, representing both market opportunities and potential savings. Furthermore, the thermodynamic properties of sCO2 may lead to compact turbomachinery of significantly reduced size compared to an equivalent steam cycle, leading to reduced capital costs. DOE recognizes the need for a collaborative path forward with industry focused on research and development which may lead to potential future development of sCO2 Brayton Cycle components, technologies and scale-up activities applicable to solar, nuclear, fossil, and geothermal heat sources.

Subcommittee. How about the STEP program to accelerate the commercialization of electric power generation using supercritical carbon dioxide?

Secretary Moniz. The Supercritical Transformational Electric Power Generation Initiative (STEP) is one component of the Supercritical CO2 (sCO2) crosscutting initiative, reflecting a collaboration effort among the Offices of Nuclear Energy (NE), Fossil Energy (FE), and Energy Efficiency and Renewable Energy (EERE) to develop supercritical CO2 Brayton cycle energy conversion systems. STEP is a one year endeavor to establish pre-commercial supercritical carbon dioxide pilot demonstration facility coordinated NE that will complement ongoing activities in other programs that are part of the overall sCO2 crosscut, including efforts to increase thermal-to-electric conversion efficiency of concentrated solar power systems, to support first-of-a-kind sCO2-based enhanced geothermal system power generation pilot tests, and to develop fossil energy systems that are more efficient and lower in cost than existing systems. Because this energy conversion system can be used by different heat sources, sCO2 systems could play an important role in the President's "all of the above" energy strategy. Coordinating STEP with industry needs will ensure that the results of research and development activities are quickly transferred to the private sector and will reduce the overall time needed to commercialize this technology.

Subcommittee. And the exascale initative? This year's budget request provides $91 million within Science and $50 million within NNSA. What do you see as the value of this program, and how soon can we expect it to be complete?

Secretary Moniz. Since the early 1950s the DOE and its predecessor agencies have defined the frontier of scientific supercomputing, using ever more powerful computers in each successive generation. Today more than half (265) of the world's fastest 500 computers – as well as five in the top ten—are located in the United States. This is a direct result of DOE investments in supercomputing for science and national security—an investment jointly stewarded by the Department's Office of Science and the National Nuclear Security Administration.

The next generation of computers, as we move toward exascale speeds, promise new capabilities for the computerized design of new materials, far

more accurate and predictive modeling of climate, the 3-D modeling of nuclear reactors, and more effective modeling of combustion, to name just a few possible applications. NNSA has nuclear security applications that are classified and include nuclear weapons performance and certification, foreign weapons analysis, and forensics. Supercomputing is a tool that enables the NNSA's national security missions. Since the end of nuclear testing, the NNSA has increasingly turned to simulation to meet its time-urgent demands. This has been and continues to be the pacing factor for the scale of simulation we need. NNSA missions, such as evaluating the impact of aging on the stockpile, benefit greatly from larger, more physics-informed, and better resolved calculations. Capable exascale computing is needed to meet anticipated mission requirements in the decadal time frame.

Today, the computer industry is at a significant inflection point and can no longer increase the performance of processors and memory simply by decreasing the feature size. DOE's proposed capable exascale program is intended to deliver a system 1000 times more powerful than today's petaflop systems but using the same power and space as the current systems. Computing is an essential tool for science, engineering and industry and addressing the challenges posed in designing capable exascale systems will benefit all of these areas, not just those directly relevant to DOE's mission. For instance, developing energy efficient components, increasing memory capacity and creating reliable and usable systems are exascale challenges that have big payoffs not only in terms of the cost of operating our facilities, but also for the broader scientific community and the U.S. computing industry.

I understand the challenges to overcoming these technology obstacles and am seeking the advice of my advisory board and others, before establishing the scale of a national program.

SUPPORT FOR DOMESTIC MANUFACTURING THROUGH EFFICIENCY

Subcommittee. U.S. manufacturing is an increasing topic of discussion in the press lately, though it is one that the subcommittee has followed with interest for some time. The Department is proposing some new manufacturing initiatives this year. How is the Department proposing to work with American manufacturers, and what are you doing to ensure that the technology we develop resides in the US and is not simply used to increase efficiency in foreign manufacturing plants?

Secretary Moniz. The Department supports investments that can bring together manufacturers, suppliers, and universities and research institutions to address manufacturing challenges across three pillars: (1) industry-specific manufacturing efficiency investments targeting energy-intense industries, (2) widely applicable energy efficiency investments as a platform for manufacturing competitiveness in multiple industries, and (3) cross-cutting materials and manufacturing process technologies investments with potential use across a range of clean energy applications.

The Department of Energy's *Clean Energy Manufacturing Initiative* (CEMI) is a comprehensive and coordinated DOE-wide effort created to increase U.S. competitiveness in clean energy manufacturing. CEMI supports the dual objectives of 1) increasing U.S. manufacturing competitiveness in the production of clean energy products and 2) boosting U.S. manufacturing competitiveness across the board by increasing energy productivity. CEMI has taken a strategic look at several renewable technologies, such as solar PV, batteries, wind turbines, and other energy technologies, to determine where U.S. competitive advantages are, where foreign entities might have a competitive advantage, and how we support smart, high-impact investments in DOE R&D projects on advanced manufacturing technologies that will not be offshored.

Because U.S. companies and academia lead the world in innovation, the Department is serious about protecting taxpayer-funded R&D related to manufacturing, as well as all activities the Department undertakes. The Department has made progress on how we treat intellectual property by successfully building into EERE's competitive funding opportunity announcements the requirement that, where appropriate: applicants submit manufacturing plans as a component of their applications (or agree that

subject inventions be substantially manufactured in the U.S.); EERE consider U.S. manufacturing plans when evaluating applications; and EERE negotiate, track and enforce U.S. manufacturing commitments.

The Department, in conjunction with U.S. manufacturers, also plays an important technical assistance role that is critical to the deployment of existing and future advanced energy efficiency technologies and practices. The Department has delivered technical assistance to thousands of U.S. industrial plants, which is saving industries billions of dollars and cutting carbon emissions by millions of tons. One example of these efforts is the Combined Heat and Power (CHP) Technical Assistance Partnerships (CHP TAPs), which promote and assist in transforming the market for CHP, waste heat to power, and district energy with CHP technologies and concepts. U.S. CHP TAP services include: market assessments for CHP, such as for critical infrastructure, and technical assistance to energy end-users and others to help them consider CHP as a viable technical and economic opportunity for them. These partnerships, as well as other technical assistance efforts, ensure that high-impact energy efficiency technologies and practices can be utilized by U.S. manufacturers by helping those firms break down barriers to deployment

DOMESTIC URANIUM ENRICHMENT

URANIUM ENRICHMENT DEMONSTRATION AGREEMENT

Subcommittee. Mr. Secretary, your fiscal year 2015 budget request includes no funding for uranium enrichment research and development. Until April of this year, such work has been done by the United States Enrichment Corporation, or USEC. The fiscal year 2014 conference report included $62 million to maintain the USEC research and development agreement through April of this year, plus another $56.6 million of transfer authority available after we approve a path forward for domestic enrichment technologies for national security needs.

How would you evaluate the progress made under the USEC R&D agreement?

Mid-April is quickly approaching. What are your plans for your relationship with USEC?

Secretary Moniz. USEC Inc. and its subsidiary, American Centrifuge Demonstration, LLC (ACD), have satisfied all of the technical milestones, performance indicators, and other test requirements set forth under the RD&D Cooperative Agreement.

As I discussed in my testimony, the Department is executing its plan to have the Oak Ridge National Lab M&O contractor assume responsibility for the American Centrifuge Project and subcontract with USEC to maintain the existing centrifuges and enrichment capability as the Department explores its options.

NATIONAL SECURITY NEED FOR A DOMESTIC ENRICHMENT CAPABILITY

Subcommittee. Mr. Secretary, some have argued that the funding spent to date on the domestic uranium enrichment demonstration project is little more than an earmark intended to bolster the bottom line of USEC.

Do you believe there is a credible national security need for a domestic uranium enrichment capability?

Secretary Moniz. Yes, there is a national security need for a U.S.-origin technology enrichment capability. This capability is required for maintaining the nuclear weapons stockpile, fueling naval reactors, and supporting nonproliferation objectives.

NATIONAL SECURITY

PLACING MOX INTO COLD STANDBY

Subcommittee. Mr. Secretary, this subcommittee has been highly critical of the Department's management of the MOX project. After a year of studying alternatives, you've made a decision to place to the MOX project in cold standby, but you still haven't chosen an alternative.

Which alternatives do you think are viable and how do the costs of those alternatives compare with the cost of constructing the MOX plant?

How much longer do you need to make a decision on an alternative?

Secretary Moniz. The Department has reviewed a number of options for U.S. plutonium disposition, including improving efficiencies in the current disposition approach of disposing of surplus weapon-grade plutonium as MOX fuel in light water reactors (LWRs), fast reactor options to dispose of weapon-grade plutonium, and non-reactor based options. Preliminary analysis shows that some options will cost more than the MOX approach and some will be more efficient than the current approach. Upon selecting a preferred option, the Department will commission an independent assessment of the option. This independent assessment will be conducted by an organization external to the Department and its laboratories and will include establishment of life cycle costs, schedules, performance and scope of the selected option.

STORAGE AND DISPOSAL OF FOREIGN SPENT FUEL SHIPMENTS

Subcommittee. Mr. Secretary, the Department has already shipped about 5 metric tons of spent nuclear fuel to DOE sites as part of the Global Threat Reduction Initiative. The Administration has made new deals with Japan, Belgium and Italy to bring even more foreign nuclear materials into the United States that will be stored or processed at DOE sites. However, the State of Idaho has suspended shipments of spent reactor fuel until the Department achieves its milestones for processing sodium-bearing liquid waste. The State of South Carolina has said they want a plan for getting the waste out of the state if you intend to ship more nuclear materials there.

Where do you plan on storing and processing these foreign nuclear materials?

How will you work with the states to gain support before finalizing your plans or entering into additional agreements for more foreign nuclear material shipments?

How will you pay for the costs to store and disposition these materials?

Secretary Moniz. DOE/NNSA's Global Threat Reduction Initiative (GTRI) continuously looks to identify additional proliferation sensitive materials that should be removed to eliminate the risk that they could fall into the hands of terrorists. Some of this material is brought to the United States for disposition, but a significant amount of GTRI's removal efforts involve returning material to Russia and downblending the material there. In all cases, GTRI works with its foreign partners to identify the best disposition pathway to eliminate this material.

The agreement between DOE's Office of Environmental Management (EM) and GTRI signed in 2004 states that GTRI will assume the responsibilities associated with the planning, coordination, and transportation of spent fuel to the Savannah River Site (SRS) and EM will be responsible for the receipt and unloading of the spent fuel at EM-managed spent fuel storage facilities at SRS and the Idaho National Laboratory (INL). EM will store and process that material according to established program plans based on the type of material. This may include sending fresh HEU to Y-12 for downblending, transporting HEU spent fuel to SRS or INL where it will be stored pending disposition with DOE's other spent fuel, and sending plutonium materials to

SRS or another site, as selected by DOE, for storage pending disposition of DOE's other excess plutonium materials.

DOE follows all requirements of the National Environmental Policy Act (NEPA) including notifying the affected states of the determination that any new Environmental Assessments are necessary and holding public hearings on any new draft Environmental Impact Statements (EIS). As part of the NEPA process, DOE would address any comments received from the States and obtain their support before making any decisions.

GTRI and EM work closely together to make sure these important DOE nonproliferation programs can be implemented in a timely manner. In accordance with the Record of Decision (ROD) that announced the establishment of the Foreign Research Reactor Spent Nuclear Fuel (FRR SNF) Acceptance Program (scheduled to end in May 2019) and DOE's established fee policy for the program. DOE charges high-income economy countries a fee to send spent fuel to the United States for disposition. Although the fee may not cover all of the costs to dispose of this material (noting that the full costs are unknown at this time due to the lack of a selected disposition pathway), GTRI has supported EM requests to increase the fee in three phases. The first phase took effect in January 2012 and the second phase in January 2014. The third phase will take effect in January 2016. For shipments of non-U.S.-origin spent fuel to SRS from other than high-income countries, GTRI pays EM the established disposal fee.

For shipments of fresh HEU, DOE charges high-income economy countries an amount that is estimated to cover all costs to receive, store, and process the material. Similarly, there is a separate fee structure for countries that ship plutonium to the United States based on the amount of material. This fee rate was established through consultations between GTRI and EM and is subject to revision should there be significant changes in circumstances involving management and disposition costs.

ENVIRONMENTAL CLEANUP

SUPPORT FROM STATES FOR MAJOR DECISIONS

Subcommittee. Mr. Secretary, I appreciate your willingness to make some tough programmatic decisions since you've been confirmed, regardless of whether we will ultimately agree with those decisions or not. However, the battle has only begun to justify and gain support for those decisions that you've made.

The State of Washington recently turned you back without agreeing to the draft framework for the Waste Treatment Plant, and the State of South Carolina is considering litigation in response to your decision to place the MOX project in cold standby.

How do you intend to work with the states and members to gain support?

Secretary Moniz. I am committed to working closely with members of Congress, States, tribal leaders, affected communities and other stakeholders in an open and transparent manner as we confront the challenges involved in implementing DOE's diverse missions. It is especially important to sound decision making that the leadership of the Department have open lines of communication with states, the congressional committees of jurisdiction, and members of congress which have DOE sites or activities ongoing in their states or districts.

With respect to the examples cited, in the State of Washington, I have met with Governor Jay Inslee, tribal leaders, and with the local elected officials in the Tri-Cities area on issues related to the Hanford Site, including the Waste Treatment Plant. In the State of South Carolina, I have met with Governor Nikki Haley and the congressional delegation on a host of issues related to the Savannah River Site. The Office of Environmental Management (EM) Acting Assistant Secretary David Huizenga has also been extremely engaged with stakeholders in Washington State, South Carolina, and at the other states in which EM has ongoing cleanup. Most recently, Mr. Huizenga held a public town hall meeting to discuss the Department of Energy's proposal to amend the Consent Decree that governs the Waste Treatment and Immobilization Plant (WTP). Similarly, former Acting NNSA Administrator Bruce Held has been extremely engaged with stakeholders at NNSA sites, including the Y-12 site in Oak Ridge, Los

Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories.

Regarding the Department's approach to the WTP, the Framework document was developed to help describe the approach the Department believed would be most beneficial for moving forward with WTP. DOE held several meetings with the State of Washington prior to submitting its proposal to amend the Consent Decree. While the State of Washington and the Department submitted separate proposals, both proposals incorporate key elements outlined in the Framework, such as moving forward with developing new capabilities to separate the low-activity waste and feed it directly to the Low-Activity Waste Facility for vitrification.

The Department remains committed to working with states and other key stakeholders as it determines the path forward for the MOX facility. Regarding the litigation, the State of South Carolina has filed suit against the Department on the MOX facility issue. It would be inappropriate for me to comment on that matter further, given that it is currently before the courts.

CONTINUED SAFETY AT THE WASTE ISOLATION PILOT PLANT

Subcommittee. Mr. Secretary, the Defense Nuclear Facilities Safety Board recently sent you a letter that the ventilation filters at the Waste Isolation Pilot Plant keeping the radioactive material contained underground is not a credited safety system and therefore cannot be assured to prevent another release of radioactive material from the mine.

What are you doing to ensure the safety of the public and Department of Energy workers from further releases?

Secretary Moniz. We agree with the Board on the importance of identifying the filtered ventilation system as a safety system. The Department has taken several actions to implement compensatory measures to:

- Prohibit the Waste Handling mode in the Underground (U/G);
- Not operate any U/G liquid fueled vehicles;
- Continue to operate the Mine Ventilation System in Filtration Mode; and
- Not enter the U/G ventilation exhaust drift.

The filtered ventilation system is working properly as designed to protect the safety of workers, public, and the environment. The interim controls and discipline being applied to the ventilation system are commensurate with those that would be found on a credited safety system. A more comprehensive evaluation of the ventilation system and its support systems is currently underway. Corrective actions will be implemented upon completion of this evaluation.

COST AND SCHEDULE FOR HANFORD TANK WASTE

Subcommittee. Mr. Secretary, you've issued a draft "Hanford Tank Waste Retrieval Treatment, and Disposition Framework" which describes a path forward for meeting Hanford's tank waste mission. You met recently with the State of Washington to discuss this framework, but the state said it would need considerably more detail. We still don't know the costs or how soon you could accomplish this new vision. Even the Department's latest project management report identifies that EM needs to develop an overarching programmatic strategy with key milestones that address the on-going challenges."

When will you be able to provide a better picture of the programmatic requirements, including feasible cost and schedule targets, for your alternative framework for processing Hanford's tank waste?

Secretary Moniz. On March 31, 2014, the Department submitted its proposal to amend the consent decree to the State of Washington. This proposal embraces the Framework's phased approach to support the Hanford tank cleanup mission. The first phase deals with completion of the Low-Activity Waste, Balance of Facilities, and the Analytical Laboratory. The WTP contractor has been directed to prepare a contract modification for completion of these facilities and to begin planning for implementation of a Direct Feed approach to the Low-Activity Waste facility.

At the same time, the Department continues to address the technical issues that are primarily associated with the High Level Waste Facility and the Pretreatment Facility. This approach contemplates two new facilities, the Low Activity Waste Pretreatment System and the Tank Waste Characterization and Storage capability. The Low Activity Waste Pretreatment System supports the direct feed of low activity waste to the Low-Activity Waste Facility, while the Tank Waste Characterization and Storage capability primarily supports the High Level Waste and Pretreatment Facilities. Until the technical issues are resolved and a new baseline and contract reflecting the resolution are created, it is not possible to confidently predict the cost of the plant or commit to when the Pretreatment Facility or WTP as a whole will be completed.

Subcommittee. What is a reasonable deadline for this?

Secretary Moniz. The Department has proposed that hot commissioning of the Direct Feed Low Activity Waste Facility be completed by December 31, 2022. The deadlines for other activities are specified in the Department's proposal that can be found at http://energy.gov/em/downloads/proposal-us-department-energy-state-washington-amend-consent-decree. For some activities, it is premature to established firm completion dates. Nevertheless, the process the Department proposes for these activities will result in the establishment of completion deadlines through the use of DOE Order 413.3B, PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF CAPITAL ASSETS.

RESOLVING SAFETY ISSUES OF THE WASTE TREATMENT PLANT DESIGN

Subcommittee. Mr. Secretary, I understand that you are developing a new baseline to monitor performance on the Waste Treatment Plant project, but that those efforts do not include direction to establish a clear path forward for continued construction of the Pretreatment and High Level Waste facilities. Rather, you've provided direction to the contractor to simply extend the current work plan by another two years.

Is there any urgency to resolving the safety issues with the WTP design?

Secretary Moniz. Yes, resolving the safety issues with the WTP design is a primary focus of the Department's efforts. A Design Completion Team was created consisting of DOE, contractor, and national laboratory personnel. This team has coordinated the development of test and analytical programs to resolve the safety issues including potential criticality, flammable gas build-up, and erosion/corrosion. In addition, DOE has contracted with the Pacific Northwest National Laboratory and the Savannah River National Laboratory to provide support for nuclear safety and technical issue resolution.

Subcommittee. How do you plan to make progress on resolving those outstanding design issues?

Secretary Moniz. The Design Completion Team, consisting of DOE, contractor, and national laboratory personnel, are coordinating the development of test and analytical programs to resolve the safety issues including potential criticality, flammable gas build-up, and erosion/corrosion.

Subcommittee. What is a reasonable timeframe to accomplish those plans?

Secretary Moniz. The resolution of the technical issues is expected to occur over the next few years. A major piece of this effort is the Full Scale Vessel Testing, for which DOE recently issued "Approach for Resolution of Pulse-Jet-Mixed Vessel Technical Issues in the Waste Treatment and Immobilization Plant" document outlining the cost and schedule for this effort.

Subcommittee. How do you expect to effectively monitor project performance in the meantime without a performance baseline?

Secretary Moniz. The contractor's work, including the two year work plan, is monitored and measured through the Earned Value Management System and agreed upon project milestones.

CLEAN ENERGY RESEARCH AND DEVELOPMENT

CLEAN ENERGY MANUFACTURING INNOVATION INSTITUTES

Subcommittee. This year's budget request proposes a significant increase for Clean Energy Manufacturing Innovation (CEMI) Institutes as part of the White House's initiative to revitalize American manufacturing, including the establishment of three Clean Energy Manufacturing Innovation (CEMI) Institutes. Each of these institutes is a 5-year, $70 million commitment, and your office has committed to three of them this fiscal year, and the budget before us proposes at least one, but potentially several, more. In fact, this budget request includes $191 million just for facilities within Advanced Manufacturing, up from just $82 million this year. This Committee has been very supportive of the Advanced Manufacturing program within the Office of Energy Efficiency and Renewable Energy. In fact, last year's omnibus appropriations bill included a $70 million increase for the program.

The budget requests have been thin on details for CEMI Institutes. Can you describe for us how these will fit into your Advanced Manufacturing portfolio? How will they make manufacturing more competitive here in the U.S.?

Secretary Moniz. The Clean Energy Manufacturing Innovation Institutes are designed to focus on foundational technologies that are broadly applicable and pervasive across multiple industries and markets, with potentially transformational technical and manufacturing productivity impact. Institutes will be partnerships between government, industry, and academia, supported with cost-share funding from Federal and non-Federal sources. Within 5 to 7 years of launching, each Institute is expected to be financially sustainable from private sector investments and other sources without further direct funding from the Federal Government, and the multi-year award funding profiles for the Institutes will reflect this expectation.

For example, the Next Generation Power Electronics Manufacturing Institute aims to develop manufacturing processes for wide bandgap (WBG) semiconductor-based power electronics that are cost-competitive and significantly more efficient at high powers and temperatures than current silicon-based technologies—leading to more affordable and energy efficient

electrical products for businesses and consumers, billions of dollars in energy savings, and high-quality U.S. manufacturing jobs.

The Advanced Composites Manufacturing Innovation Institute will be competitively selected to seek to develop high-speed and efficient manufacturing that lowers the cost and the amount of energy used to produce advanced fiber-reinforced composites for clean energy applications. Advanced composites could help manufacturers deliver clean energy products with better performance and lower costs such as lightweight vehicle fleets with record-breaking fuel economy; lighter and longer wind turbine blades; and high pressure tanks for transportation of natural gas- and hydrogen-fuels.

The Clean Energy Manufacturing Innovation Institutes are coordinated with the Advanced Manufacturing Office's other R&D activities, as well as other EERE Technology Offices. EERE leverages and complements these new Institutes' efforts to develop and transition foundational technologies into the U.S. clean energy marketplace by coordinating and optimizing existing EERE research, development, and demonstration of WBG and advanced composites technology through two focused initiatives crosscutting our Technology Offices: the Next Generation Power Electronics Initiative—across the Vehicles and Advanced Manufacturing Technology Offices—and the Carbon Fiber Composites for Clean Energy Initiative—across the Vehicles, Bioenergy, Fuel Cells, Wind, and Advanced Manufacturing Technology Offices.

Subcommittee. How many will there be in all, and what are the topic areas they will research?

Secretary Moniz. EERE's FY 2015 Budget Request supports the creation of at least one new Clean Energy Manufacturing Innovation Institute, consistent with the President's vision for a larger, multi-agency National Network for Manufacturing Innovation (NNMI), and provides annual and forward-funded support for the two existing Institutes listed above. DOE is planning to invest $70 million into each Institute to be expended over the next 5 years with a forward-weighted funding profile. The FY 2015 Budget request also supports the final installment of DOE's funding contributions for the DOD-led pilot Manufacturing Innovation Institute, the National Additive Manufacturing Innovation Institute (now called America Makes).

Potential topic areas may include scale-up of applied materials genome approaches and nanomaterials for energy; next generation electric machines; process intensification for chemical processes; bio-manufacturing scale-up; smart manufacturing for energy intense processes; and cross-cutting emergent topics in advanced manufacturing for clean energy. These potential topic areas will be developed in consultation and input from stakeholders. Workshops with industry, academia, and other government organizations will be held on each of these topics to determine their suitability for an Institute FOA.

DEFENSE PRODUCTION ACT INITIATIVE

Subcommittee. This year's budget request once again includes $60 million to support a Navy initiative to produce hydrocarbon jet and diesel biofuels for military use. This activity was first supported in last year's omnibus appropriations bill for $45 million.

Mr. Secretary, as you're aware, this Committee has expressed concerns in the past about this proposal. In particular, if the technologies are not mature enough, the program would build a bunch of biofuels plants that would go out of business as soon as the military stops buying their above-market product. Can you tell us how the $45 million already appropriated is being spent?

Secretary Moniz. With Congress' support, DOE received the authority in FY14 to support DPA activities to accelerate the development of cost-competitive advanced drop-in hydrocarbon biofuels for the military. By bringing cost-competitive, advanced biofuels to scale, we hope to demonstrate that these projects can eventually produce renewable diesel and jet fuel in the market without government subsidies.

Previously appropriated Navy funds are being used to support four projects through Phase I activities which include front-end engineering design, site selection, and permitting. The $45 million appropriated to DOE will be used for construction, capital equipment purchases, and commissioning of a sub-set of these four projects.

Subcommittee. How will the $60 million included in this year's request be spent?

Secretary Moniz. The projects are currently concluding Phase I and will undergo a merit review in FY 14. A sub-set of the four projects will be selected to proceed to Phase II, with the number of projects selected dependent on the status of funds available. In Phase II, projects will submit proposals for construction, capital equipment purchases, and commissioning, which will be reviewed by technical experts from all three agencies (DOD, USDA, and DOE). The $60 million will be used for Phase II activities, which includes construction, operation, and data collection.

Subcommittee. How much do you expect this total initiative to cost, and ultimately what rewards will these federal investments return for us?

Secretary Moniz. The total DOE commitment for this initiative is $170 million. The DPA biofuel effort is an important element of a comprehensive U.S. Government investment in national energy security. This project, co-sponsored by the Department of Energy, Department of Agriculture, and the Department of Defense, works with the private sector to accelerate the development of cost-competitive advanced drop-in hydrocarbon biofuels for the military. In May 2013 four companies were selected for Phase I of the DPA Advanced Biofuels Production Project. These companies, if successful in both Phases I and II, are expected to deliver up to 170 million gallons of military-compatible fuels per year. The government investment for this effort is expected to be exceeded by the cost share provided by the private sector.

ELECTRIC VEHICLE "EV EVERYWHERE" AND "ONE MILLION CARS" INITIATIVES

Subcommittee. Mr. Secretary, in March 2012, the President announced an "EV Everywhere" initiative, to be conducted by the Department of Energy's Office of Energy Efficiency and Renewable Energy, Office of Science, and ARPA-E. The program aims to lower the cost of American-made electric vehicles, and is related to the President's goal of having one million electric-drive vehicles on the road by 2015.

How many EV's are on the road today, and how on track do you think we are for reaching the President's goal by 2015?

Secretary Moniz. The goal to be the first country in the world to have one million electric vehicles on the road by 2015 is an ambitious milestone to maintain the growth trend of the plug-in electric vehicle (PEV) market and significantly reduce U.S. dependence on oil for transportation.

Growth of plug-in electric vehicle (PEV) sales since market introduction has outpaced historical hybrid electric vehicle (HEV) sales growth by almost 200%, and HEVs are entering the mainstream[1].

- HEV market share in 2013 was 3% of light-duty vehicle (LDV) sales; PEV market share in 2013 was 0.6% of LDV sales.
- PEVs reached nearly 175,000 cumulative sales in December 2013 and are on track to pass the 200,000 sales milestone by spring 2014, about 40 months after the introduction of the production models of the Chevrolet Volt and Nissan Leaf. By comparison, HEVs took 60 months to achieve 200,000 total sales nearly a decade ago.

The momentum is building as consumers are embracing PEVs in the market.[2]

- Total U.S. PEV sales in model year 2013 nearly doubled those of 2012, approaching 100,000 sold for the year alone.

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[1] "Light Duty Electric Drive Vehicle Monthly Sales Update." Argonne National Laboratory. http://www.transportation.anl.gov/technology_analysis/edrive_vehicle_monthly_sales.html

[2] "Light Duty Electric Drive Vehicle Monthly Sales Update." Argonne National Laboratory. http://www.transportation.anl.gov/technology_analysis/edrive_vehicle_monthly_sales.html

- Additionally, nearly 10,000 plug-in vehicles were sold in the month of December 2013, up 28% over the sales in December 2012.

Subcommittee. We hear conflicting reports about the health of the EV market. How healthy is the market, and where is it heading?

Secretary Moniz. The market penetration for plug-in electric vehicles (PEVs) continues to grow. U.S. PEV sales nearly doubled in 2013 compared to the previous year, and consumers are adopting PEVs at a faster pace than hybrid vehicles were when first introduced a decade ago. PEVs reached nearly 175,000 cumulative U.S. sales in December 2013 and are on track to pass the 200,000 sales milestone by spring 2014, about 40 months after the introduction of the production model of the Chevrolet Volt and Nissan Leaf.[3]

We are on the right path, as PEV sales continue to rise. However, it will take millions of vehicles to truly transform our transportation sector and significantly reduce our dependence on petroleum. As such, we need to continue to pursue the research and development needed to further reduce cost and improve performance of PEVs – a key aspect of the *EV Everywhere* Grand Challenge.

Subcommittee. There are a number of other factors that impact the Administration's goal of electric vehicle deployment — events in the private sector and government policies like vehicle tax credits and gas mileage standards. How will the Department's programs interact with these other federal activities?

Secretary Moniz. The *EV Everywhere Grand Challenge* focuses on the technical innovations – research and development to overcome cost and performance barriers – needed to achieve widespread use of plug-in electric vehicles (PEVs) among mainstream consumers and enable PEVs to compete against conventional vehicle technologies without subsidies. This work complements policies and other activities to bring PEV technologies to market and facilitate early adoption. Successful R&D has enabled auto manufacturers to begin market introduction and will enable them to use vehicle electrification and other advanced fuel-efficient vehicle technologies

[3] "Light Duty Electric Drive Vehicle Monthly Sales Update." Argonne National Laboratory. http://www.transportation.anl.gov/technology_analysis/edrive_vehicle_monthly_sales.html

to comply with government policies such as CAFE standards. Tax credits and other incentives encourage consumer early adoption, but market penetration – and full realization of the petroleum reduction benefits of electric drive – will depend on the technology's ability to compete in terms of cost and performance with incumbent vehicle technologies that dominate the mainstream market today. That is why the research under the *EV Everywhere* Grand Challenge is so important.

The Department coordinates with other Federal agencies, including regular meetings, frequent communication, and both formal and informal interactions with the Environmental Protection Agency, Department of Transportation, and Department of Defense. In addition, it works closely with U.S. automobile manufacturers through partnerships such as U.S. DRIVE, which provides a framework for frequent and detailed interaction with industry at both the technical and leadership levels. This activity helps to ensure the Department's activities remain focused on the most critical barriers to technology commercialization and avoid duplication of effort.

NUCLEAR ENERGY

THE MARKET FOR NUCLEAR ENERGY: THE CASE OF VOGTLE

Subcommittee. Secretary Moniz, you announced last month the Department's approval of $6.5 billion in loan guarantees for two new nuclear reactors under construction in Georgia by a consortium led by Southern Co. The expansion at Vogtle signifies the first nuclear power plant to be built from scratch in more than three decades.

Can you provide us an update on how construction is proceeding?

Since it's the first new plant in a long time, are we learning anything yet from the experience?

Do you know the expected timeline to approve the final loan guarantee associated with this project?

Secretary Moniz. Georgia Power Company (GPC) regularly reports the construction progress on Vogtle Units 3 and 4 to the Georgia Public Service Commission and the Department monitors construction progress as a part of administering the loan guarantee. GPC continues to make significant progress and is learning lessons that are helping to accelerate the project.

In March, GPC installed the largest AP1000 module into the Unit 3 nuclear island, the 2.2 million pound CA20 which houses the reactor spent fuel pool. GPC's February 2014 report covering progress in 2013 reported significant visible progress building both Unit 3 and 4 nuclear islands, which will house the Westinghouse AP1000 reactors. The Unit 3 turbine island and cooling towers have achieved significant vertical elevation. Progress reports indicate that the project is approximately fifty percent complete. GPC reports AP1000 Unit 3 commercial operations could be achieved in the fourth quarter of 2017 and Unit 4 a year later.

The construction of Vogtle is providing valuable experience and information to the industry and to the team working on Vogtle, as well. Much of that experience is being shared. For example, the industry now has demonstrated experience licensing a reactor under the Nuclear Regulatory Commission combined operating license framework. Other utilities considering

Westinghouse AP1000 reactors are closely monitoring Vogtle Units 3 and 4 and are learning from the Vogtle construction experience. The Vogtle construction has also expanded the nuclear workforce and vendor supply chain. The Department believes these results will contribute to the efficiency of future nuclear power plant construction.

While a specific timeline is unavailable, the Loan Programs Office continues to work with the Municipal Electric Authority of Georgia (MEAG) towards closing on the remaining $1.8 billion loan guarantee for the Vogtle project.

NUCLEAR FUEL AND WASTE DISPOSITION

THE ADMINISTRATION'S STRATEGY FOR USED NUCLEAR FUEL DISPOSITION

Subcommittee. Mr. Secretary, this year's budget request, like last year's, includes a proposal to implement the Department's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*, which would reform the nuclear waste management program and its current funding structure. The proposal, estimated at $5.7 billion over the first ten years, with $1.3 billion scored as mandatory, would support construction and operation of a pilot interim waste storage facility and full-scale, long-term geologic disposal without considering Yucca Mountain. Congress has yet to take action on this proposal.

Can you discuss the highlights of the proposal, where things currently stand legislatively, and how you are pursuing its adoption?

Last year's omnibus appropriations bill provided $60 million for used nuclear fuel disposition activities, which will be needed regardless of whether Yucca is used as a permanent geologic repository or not. How are you spending that funding?

This year's request includes $79 million, of which $24 million would be derived from the Nuclear Waste Fund (NWF). In terms of the research itself, can you describe for us what you're proposing to study and what new or expanded activities this increase would support? Would this research be applicable to Yucca Mountain?

In a more general sense, what do you currently have authorization to do in terms of the research, development, transportation, and storage of nuclear waste disposal, and what do you need new authorization to do for non-Yucca solutions to nuclear waste disposal?

Secretary Moniz. In FY 2014, the Department is spending $30M on research and development (R&D) activities and $30M on integrated waste management activities. The R&D activities are identifying alternatives and conducting scientific research and technology development to enable storage, transportation, and disposal of used nuclear fuel and wastes generated by existing and future nuclear fuel cycles. The integrated waste

management activities are laying the ground work and developing options for decision makers on the design of an integrated waste management system.

- R&D activities are being conducted for disposal as well as storage and transportation of used nuclear fuel and high-level radioactive waste. The objectives of disposal R&D are to provide a sound technical basis for multiple viable disposal options in the U.S., increase confidence in the robustness of generic disposal concepts, and develop the science and engineering tools needed to support the implementation of disposal concepts. The objectives of storage and transportation R&D are to develop the technical basis for extended storage of used nuclear fuel and then fuel retrievability and transportation after extended storage.
- Integrated waste management activities support the Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste* and are limited to those that are permitted under existing legislative authority. These activities include planning for a consent-based siting process, developing conceptual designs for interim storage, planning for large-scale transportation with a focus on used nuclear fuel from shut down reactor sites, and performing cross-cutting analyses and evaluations of storage, transportation, and disposal with an integrated, systems approach. Full implementation of the Strategy requires legislation.
- The FY 2015 request continues the integrated waste management activities described above at $30M, of which $24 million would be derived from the Nuclear Waste Fund (NWF). The R&D activities would increase from $30M in FY 2014 to $49M in FY 2015. This increase is required to accelerate activities to develop the technical knowledge necessary to support long-term storage of high-burnup used nuclear fuel. The nuclear industry has shifted to high-burnup fuel and this fuel has different mechanical properties than the lower-burnup fuel used in the past.
- Specific activities that require the increase to R&D funding include the collaboration with the Electric Power Research Institute team that is developing a demonstration to monitor and inspect high-burnup used nuclear fuel in dry storage over an extended period of time. Existing fuel handling facilities at Idaho National Laboratory are being evaluated for adaption to accept today's large transportation casks and then maneuver and inspect the used fuel in a dry

environment. Advanced instrumentation is being developed to permit long-term, online monitoring of dry cask storage systems.

- Regarding research applicable to Yucca Mountain, disposal R&D activities today are focused on developing a sound technical basis for multiple viable disposal options and generic disposal concepts. Storage and transportation R&D is applicable to all disposal options.

Subcommittee. One of the least visible impacts of the Administration's Yucca Mountain policy is that U.S. citizens are effectively being taxed for the Department's failure to live up to its contractual responsibility to take spent nuclear fuel off the hands of the private sector. In fact, the federal government's liability has increased in 2013 to $25.1 billion in 2013, with $3.7 billion already paid from the Judgment Fund.

In general, what effect have the Administration's attempts to terminate Yucca Mountain had on the courts' decisions? Have settlements and judgments against the Department increased since the policy change in 2009?

Secretary Moniz. The Administration's determination that Yucca Mountain was not a workable solution has had no effect on the decisions rendered by the U.S. Court of Federal Claims in the damages cases brought against the Government as a result of the delay in beginning the acceptance of spent nuclear fuel in accordance with the provisions of the Standard Contract.

As of 9/30/09, the Government had paid approximately $566 million from the Judgment Fund to cover settlement payments and Court-ordered damages as a result of the spent nuclear fuel litigation.

As of 9/30/13, the Government had paid approximately $3.7 billion from the Judgment Fund to cover settlement payments and Court-ordered damages as a result of the spent nuclear fuel litigation.

These additional amounts are not related to the Administration's determination that Yucca Mountain was not a workable solution. Instead, the payments for both final judgments and settlements reflect the additional costs incurred as the result of delays in performing the Standard Contract. These delay-related costs will continue to be incurred unless the government begins performance under the Contract. The Administration has put forth its Strategy and supporting Budget proposals, laying out a stable, integrated system for nuclear waste management and disposal designed to limit, and then end, liability costs by making it possible for the government to begin performing on its contractual obligations.

Subcommittee. Until it was terminated, Yucca Mountain was scheduled to begin accepting nuclear waste later this decade. The Administration's new plan calls for a large interim storage facility to begin accepting waste by 2025, at the earliest. This means that, in the best case, spent fuel isn't going anywhere until 2025.

Secretary Moniz. The Administration's Strategy calls for a pilot interim storage facility to begin operations by 2021, with an initial focus on accepting spent nuclear fuel from shut-down reactor sites and a larger interim storage facility to begin accepting waste by 2025.

Subcommittee. As I mentioned before, your request proposes to use NWF funds for an alternative waste management plan to Yucca Mountain. As I'm sure you're aware, Mr. Secretary, in November the D.C. Circuit Court unanimously ruled that you must stop collecting NWF fees "until such time as either the Secretary chooses to comply with the Nuclear Waste Policy Act as it is currently written, or until Congress enacts an alternative waste management plan."

Can you provide us with an update on the Department's response to the Court's ruling?

Secretary Moniz. In accordance with the November 19, 2013 decision and December 20, 2013 mandate of the U.S. Court of Appeals for the D.C. Circuit in *National Association of Regulatory Utility Commissioners v. United States Department of Energy*, the Department submitted to Congress, on January 3, 2014, a proposal to adjust the Nuclear Waste Fund fee to zero. As stated in the proposal, the proposal was not the result of and is not consistent with the determination the Secretary of Energy is required to make pursuant to the Nuclear Waste Policy Act (NWPA), 42 U.S.C. 10101 *et seq.*, regarding the adequacy of the statutorily-established fee. The Secretary of Energy has not determined, as required by the NWPA, that the fees being collected are in excess of those required to offset the costs of the program; nor has the Secretary determined that collecting no fee will "insure full cost recovery." 42 U.S.C. 10222(a)(4). Thus, this proposal, mandated by the Court of Appeals, is not consistent with the process established in the NWPA for adjusting the fee charged to utilities. And as stated in the proposal, the proposal was submitted "subject to any further judicial decision in this proceeding." Assuming no further action by Congress, the proposal will become effective, pursuant to NWPA section 302(a)(4) "after a

period of 90 days of continuous session have elapsed following the receipt" of the proposal.

Subcommittee. Given the Court's ruling that the Department can no longer collect utility fees until either (1) the Administration changes its Yucca Mountain policy or (2) Congress amends the Nuclear Waste Policy Act, do you think it prudent to propose using NWF funds in this year's request for an alternative waste management plan to Yucca Mountain before Congress has even deliberated upon such a plan?

Secretary Moniz. The current NWF balance exceeds $30 billion. As described in the answer to Question 18 above, the Department is authorized under existing law to conduct certain activities under the NWPA other than the development of a repository at Yucca Mountain. The FY 2015 budget requests $24 million from the Nuclear Waste Fund (NWF) only for activities currently authorized under the NWPA, in order to assist the Department in meeting its ultimate obligation to dispose of the nation's used nuclear fuel and high-level radioactive waste.

DOE RESPONSIBILITIES FOR THE NRC YUCCA MOUNTAIN LICENSE APPLICATION

Subcommittee. Mr. Secretary, the DC Circuit Court of Appeals has definitively ruled that the Administration's refusal to finish the Yucca Mountain license application was illegal. As a result, the NRC has restarted the license application process, at least to finish the final Safety Analysis Report (SAR), which we expect to be issued in January. The NRC has also requested that the DOE supplement its environmental impact statement on the Yucca Mountain repository with additional information pertaining to groundwater. I understand that you have refused to do so, and that DOE and NRC will be meeting on April 7 to discuss the matter.

What's your reasoning for refusing to do as requested?

Secretary Moniz. As explained in the Department's February 28, 2014 letter to the Nuclear Regulatory Commission (NRC), the NRC is the ultimate adjudicator in the Yucca Mountain license proceeding, and the NRC, rather than the Department, must eventually determine whether any groundwater analysis is sufficient and whether adoption of the Department's environmental review, as supplemented, is practicable. Accordingly, the Department will provide the NRC with an updated version of the report it provided to the NRC on July 30, 2009, entitled, *Analysis of Postclosure Groundwater Impacts for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada.* This updated analysis will, in the view of Department staff, provide the NRC with substantially all of the technical information necessary to inform a draft environmental impact statement.

Subcommittee. The Court has ruled that the Administration must fulfill Congress's direction on Yucca Mountain. Your refusal to support the NRC could easily be seen as an attempt by the Administration to find a way to not just resist Congressional intent, but also that of the Courts. Do you commit to using your position to fully follow Congressional intent as directed by both the legislative and judicial branches of government?

Secretary Moniz. Through activities such as working to provide the NRC with the technical input to the supplemental environmental impact statement, the Department is supporting the NRC's review of the Yucca Mountain license application.

The Department remains committed to following the law.

DOE ADJUDICATORY RESPONSE TEAMS

Subcommittee. The issuance of the last SAR is not the end of the license application process. The NRC must reconstitute its adjudicatory process, and the DOE must reestablish its teams to respond to questions posed by the NRC during this phase.

How much will it cost to reestablish these teams?

Secretary Moniz. The Department has not done a detailed estimate of how much it would cost to reestablish its teams to respond to questions posed by the NRC during a resumed adjudicatory process. It is reasonable to assume that the annual costs of establishing and operating such teams would be a portion of the $196,800,000 requested in the Administration's FY 2010 budget for the Department's Office of Civilian Radioactive Waste Management, given that such request was limited to supporting the license proceeding for a repository at Yucca Mountain. The precise amount of such costs will depend on a variety of factors which are presently unknowable.

Subcommittee. Is this funding requested in this budget request? Why not?

Secretary Moniz. No. Based on the November 18, 2013 NRC order, the adjudicatory proceeding for the Yucca Mountain license application remains suspended. *See U.S. Department of Energy (High-Level Waste Repository)*, CLI-13-08, at 16-18.

ELECTRICITY DELIVERY AND ENERGY RELIABILITY

SECURITY OF THE ELECTRICITY GRID

Subcommittee. Mr. Secretary, earlier this month several news outlets picked up on a Federal Energy Regulatory Commission (FERC) study that the entire U.S. electricity grid could be brought down by taking out certain electric-transmission substations. This is a few months after another story, published by *The Wall Street Journal*, revealed a shooting attack outside of a San Jose, Calif., substation in which gunmen shot 17 large transformers in 19 minutes. In response to that shooting, FERC ordered the North American Electric Reliability Corporation (NERC) within 90 days to develop physical protection standards, particularly those at critical substations. I'd like to delve into a few issues related to the security of our electricity grid.

First, reports like these underscore the risks associated with the inter-reliability of our current centralized power infrastructure and the need to integrate the electricity grid. Can you discuss the Department's efforts to guard against grid instability and to protect it against physical attack?

Secretary Moniz. FERC's analysis is a valuable first step in analyzing the physical security needs of the U.S. electric grid. Models have limits, however, and FERC applied static planning models to represent a dynamic operational problem; the results are illustrative but not definitive. Therefore, the results are best used as an input to a collaborative process among industry, and oversight organizations, to identify physical and cyber security threats, vulnerabilities, and impacts.

DOE is leading a significant effort, in coordination with the interagency, DOE National Laboratories, academic institutions, and the private sector, to (1) identify the most critical infrastructure, (2) identify the vulnerabilities and risks to those infrastructures, and (3) identify mitigation measures.

As part of the Department's responsibility as the Sector Specific Agency, we are working with the Power Marketing Administrations and the Sector Coordinating Councils to develop a regionally based resiliency approach to analyze criticality, identify vulnerabilities, and conduct a combined physical and cyber risk-threat assessment. Additionally, DOE and the Department of Homeland Security (DHS) (in coordination with the FBI, FERC, NERC, the Electricity Sector Information Sharing and Analysis Center (ES-ISAC)

partners, and industry experts) co-led a physical security awareness campaign in 10 cities across the country. There, owners, operators, state and local governments, and law enforcement were provided threat briefings. This outreach was in response to the recent acts against the energy sector. These briefings raised awareness and provided industry and state and local law enforcement an overview of the evolving threat, as well as an understanding of available tools, resources, and best practices designed to enhance information sharing, physical security, and resilience.

Subcommittee. Second, does the U.S. have an interagency process regarding physical security standards to the grid, and if not, should we?

Secretary Moniz. The ability to invoke mandatory standards is governed by statutory authority, and that responsibility lies with FERC. The Energy Policy Act of 2005 (EPACT 2005) expanded FERC's role under the Federal Power Act in the area of electric reliability. FERC has the authority to certify one Electric Reliability Organization (ERO) to develop and enforce mandatory reliability standards that provide for an adequate level of reliability of the bulk-power system. Furthermore, FERC has jurisdiction for approving these reliability standards and enforcing compliance among the users, owners, and operators of the bulk power system.

The current standards development process is an industry led process being directed by NERC. Government agencies participate as observers as part of the drafting team. DOE is serving as an observer on this drafting team.

Subcommittee. Did the Department of Energy consult with the Federal Energy Regulatory Commission about its order to the North American Electric Reliability Corporation?

Secretary Moniz. No, DOE was not consulted by FERC prior to the release of the order; DOE was not aware of the order until it had been released by FERC.

Subcommittee. Are you formally brought into these FERC decisions in your responsibility to protect the electricity grid?

Secretary Moniz. No, we are not formally brought into these decisions. However, DOE would welcome the opportunity to work with FERC during the rule-making process.

Subcommittee. Third, did any organization at the Department of Energy consult on this event? Is your office playing any role in assisting NERC to develop physical protection standards?

Secretary Moniz. The Department supported the investigation and lessons learned process after this event. DOE coordinated with DHS and FERC following notification of the incident. The Department sent staff from the Office of Electricity Delivery and Energy Reliability (OE) to California soon after to meet with the FBI office leading the investigation, Pacific Gas & Electric (PG&E), and Lawrence Livermore National Laboratory (LLNL) to receive a briefing of the incident and an update on the investigation. LLNL was consulted by PG&E to do an assessment and analysis of the security of the Metcalf substation and a number of other critical PG&E substations soon after the incident.

The ability to invoke mandatory standards is governed by statutory authority, and that responsibility lies with FERC. DOE does not have an active role in participating in the regulatory standards processes. The current standards development process is industry-led, directed by NERC. Government agencies participate as observers as part of the drafting team. OE has provided staff to serve as an observer on this drafting team.

This also brings up the issue of cyber security. The energy sector's critical infrastructure has been subjected to a dramatic increase in focused cyberattacks in recent years. Your Department has the responsibility of protecting the electricity grid and other energy infrastructure against the ever-present threats of a cyberattack.

Subcommittee. Can you talk us through the state of the energy's sector's cyber security? What are our existing capabilities, who are the bad actors, and how do energy control systems differ from normal IT systems in the event of a cyber incident?

Secretary Moniz. There are many privacy, protection, security, and legal constraints to collecting and maintaining data from the sector which make it very difficult to quantify the state of cybersecurity. Based upon OE's outreach with the energy sector, the state of cybersecurity can best be described as improving. OE itself does not secure or protect the energy sector. This is the responsibility of the more than 6000 companies that deliver all forms of energy. OE builds industry capacity by developing tools

and technology and collaborating with Federal agencies and industry to improve existing cybersecurity capabilities to defend against all bad actors.

Critical infrastructure owners and operators in the energy sector need to protect both their information technology systems and their energy control systems. There are significant differences between the two types of systems. Unlike IT systems, energy control systems are required to be operational at all times to maintain the energy balance between energy sources and energy users. Energy control systems also need to respond within milliseconds to place the energy delivery system in a safe state should an event occur that would damage the system.

Subcommittee. Is our energy infrastructure currently capable of surviving a major cyber incident while sustaining critical functions?

Secretary Moniz. The energy industry in the United States has a good record of maintaining operations and recovering from incidents that interrupt the delivery of services. Utilities and oil and natural gas companies are able to switch to manual operations in order to maintain critical functions for periods of time.

As the cyber threat grows in frequency and sophistication, DOE, in its leadership role as the Sector-Specific Agency for the energy sector, is working with Federal partners and industry to strengthen the energy sector's ability to respond to and recover from a major cyber incident. This includes development of robust information sharing and situational awareness tools, a cyber incident playbook, a 5-year roadmap of industry required capabilities, and regular exercises to test incident response capabilities. It also pursues a robust research and development program that advances cutting-edge cybersecurity solutions for the energy sector that are uniquely designed to address energy delivery systems.

Subcommittee. How can this Committee be helpful in providing you the resources you need to develop and implement new technologies to keep our energy infrastructure secure?

Secretary Moniz. Cybersecurity continues to be a priority for the Department, and the FY 2015 budget request of $42 million for the Cybersecurity for Energy Delivery Systems program reflects the importance and urgency of our efforts in this critical area.

FOSSIL ENERGY RESEARCH AND DEVELOPMENT

OIL SHALE

Subcommittee. Mr. Secretary, we hear a lot about the Administration's "all of the above" approach to our energy problems in order to reduce our reliance on imported oil. In fact, the U.S. Geological Survey released a report last year in which it found significant potential energy resources of shale oil.

I understand there are significant technical obstacles to extracting oil from these oil shale formations. Currently technologies require large quantities of water during extraction, and because the deposits are actually a precursor of oil, we need to heat them to turn the substance into oil.

Mr. Secretary, what do you view as the appropriate role for government research, especially given the incredible potential here? What is the government doing to realize this untapped resource?

Secretary Moniz. America's abundant unconventional oil (including oil shale) and natural gas resources are critical components of our Nation's energy portfolio. The environmentally prudent development of these resources enhances our energy security and fuels our Nation's economy.

In addition to the significant technical challenges to development of U.S. oil shale, the more difficult issues related to the commercialization of domestic oil shale appear to be related to high capital costs, uncertainties regarding oil shale development regulations, and most importantly, environmental considerations, rather than process-related technical challenges. Therefore, we will continue our research to address these critical issues and the resulting resource, hazard, and environmental implications.

INTERAGENCY METHANE STRATEGY

Subcommittee. Last Friday, President Obama announced plans to curb emissions of methane as part of his Climate Action Plan. Mr. Secretary, following that announcement, you acknowledged that the Department of Energy will "play an integral, active part of these efforts" and that the Department is investigating cost-effective emissions reductions for methane.

Can you talk us through the Department's efforts to support this interagency methane strategy?

Secretary Moniz. The Department's efforts and collaboration within the interagency methane strategy are documented in the "Strategy to Reduce Methane Emissions" that was released by the White House in March 2014. This strategy states that USDA, EPA, and DOE, in partnership with the dairy industry, will jointly release a "Biogas Roadmap" outlining voluntary strategies to reduce U.S. dairy sector greenhouse gas emissions by 25 percent by 2020.

In addition, in coordination with the Executive Office of the President and other Federal agencies, Secretary of Energy Ernest Moniz hosted a roundtable discussion on March 19, 2014 with leaders from industry, state governments, academic researchers, nongovernmental organizations, and labor. DOE has hosted additional roundtable discussions with stakeholders, with the primary objective of accelerating the adoption of best practices for reducing methane emissions from natural gas systems in a manner that is environmentally sound and protective of human health and safety.

The initial focus of the Quadrennial Energy Review (QER), to be released in January of 2015, will be infrastructure for energy transporting, transmitting, and delivering energy. Building on the DOE roundtables, the QER will evaluate methane emissions abatement opportunities from the processing, transmission, storage and distribution segments of the natural gas supply chain.

Subcommittee. What specific activities are supported in this year's budget request?

Secretary Moniz. The 2015 Budget proposes a new $4.7 million DOE program to initiate a midstream natural gas infrastructure program focused

on reducing methane emissions from the wellhead to the utility distribution system. This program would focus on several key research and technology development areas, including the development of technologies for leak detection and monitoring, pipeline inspection and leak repair without having to evacuate gas from the pipelines, smart pipeline sensors, and compressor controls to reduce emissions and increase operational efficiency.

As part of DOE's ongoing unconventional gas program, DOE is funding two projects - one at Pennsylvania State University and one at Carnegie Mellon University - using tracer release methods and tower, automobile, aircraft monitoring, and other methods to measure and model methane emissions from the Marcellus region in Pennsylvania.

DOE's Advanced Research Programs Agency-Energy program announced the *Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR)* program to fund technologies to deliver an order-of-magnitude reduction on the cost of methane sensing, thus facilitating much wider deployment throughout all segments of natural gas systems.

LOAN GUARANTEE PROGRAMS

TITLE 17 LESSONS LEARNED

Subcommittee. Mr. Secretary, it's no secret that the initial rollout of the Title 17 loan guarantee program experienced many problems. The program has been the subject of many reports, such as the Allison Report and numerous GAO studies, which criticize the program on how it measures performance and conducts oversight. The Loan Programs have been quiet recently and I can only assume it's because the Loan Program Office was ensuring how to effectively manage and conduct oversight on taxpayer funds.

Can you update the Committee on what you've done to address the management and oversight criticisms the Loan Program has received?

How does the Loan Program Office become aware of potential problems and issues? What has been done to develop a more robust early warning system if a project applicant is in trouble?

Mr. Secretary, when we last brought the Director of the Loan Programs Office up to testify, he assured us that the Loan Programs Office was implementing a new data management system to better conduct oversight of loans. Can you provide us with an update on where that new data management stands?

If this system was implemented at the genesis of the Loan Programs Office would it have caught or more effectively alerted LPO of problems with applicants? How does this system ensure the mistakes of the past will not appear in the future?

Secretary Moniz. The Department took the Allison Report and GAO audits very seriously and has made significant progress in implementing the majority of their recommendations. Specifically:

- The Department has strengthened its internal oversight of the Loan Programs by restructuring the former LPO Credit Division to encompass a Risk Management Division. The Department has hired a number of experienced professionals across the organization including a new Executive Director, a Director of Risk Management, a new

Senior Advisor to the Executive Director, a permanent Chief Counsel, and several new senior Portfolio Managers.

- The Loan Programs Office has improved, and will continue to improve, processes and systems for proactive monitoring, loan administration, compliance, and reporting, all of which contribute to the Department's comprehensive early warning system. The Program monitors market, regulatory, and counterparty risks that can affect credit performance and develops periodic reports for each transaction which provides an in depth analysis of the risks.
- Using its work management system, the Program generates periodic management reports for senior LPO and DOE leadership. LPO is currently enhancing the utility of its content management system and is in the process of rolling out a management information reporting system (MIRS) that should allow for even more robust reporting on the portfolio and the Program's performance.
- As with all Federal credit programs, the LPO is working diligently to implement the recently revised Circular A-129 which prescribes policies and procedures for justifying, designing, and managing Federal credit programs and for collecting non-tax receivables. The updated A-129 provides best practices for program implementation, oversight, and reporting as a means to protect the government's resources while pursuing agency goals.

ADVANCED TECHNOLOGY VEHICLE MANUFACTURING PROGRAM

Subcommittee. Mr. Secretary, the credit subsidy cost for successful applicants in the ATVM program must be provided by an appropriation from Congress. For ATVM's initial $25 billion loan authority, Congress appropriated $7.5 billion, based on an estimate from CBO. There is currently $16 billion left in loan authority but less than half of the original credit subsidy cost appropriation remains.

You have announced intent to resurrect the ATVM program this year yet no additional funds were requested for the credit subsidy costs. Do you anticipate that the remaining credit subsidy costs will cover the rest of ATVM's loan authority?

Secretary Moniz. We anticipate that the remaining appropriated credit subsidy for the ATVM program will be sufficient to cover the remaining loan authority.

ATVM DORMANCY

Subcommittee. The ATVM program issued $6 billion in loans in 2009, $2.5 billion in loans in 2010 and only, $50 million in 2011.The Committee's understanding is that at that time, the Department was having difficulty, within the existing authorization, applying the standards of the loan program to anything but Original Equipment Manufacturers (OEMs)

What has changed in the market that leads you to believe there will be a need for additional loans since 2011?

I believe two of original loans, VPG and Fisker defaulted on their loans. What have you changed in your evaluation and monitoring processes as a result of these loans?

I understand that the market determines the frequency of the applications and loans you will eventually finalize. However, it would seem that there needs to be a more systemic approach to the timing and amount of loans to ensure that taxpayer funds are being spent appropriately. Do you have an estimated time line at how long it will take to fully exercise ATVM's remaining loan authority?

Secretary Moniz. The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program has supported the production of over 4 million cars and approximately 35,000 direct jobs across eight states, including California, Illinois, Michigan, Missouri, Ohio, Kentucky, New York and Tennessee. To date, the program has issued more than $8 billion in loans including successful loans to Ford Motor Company, Nissan North America, and Tesla Motors.

While the economics of the automotive sector have improved, conversations with motor vehicle parts manufacturers highlight strong sector growth that is leading to capacity constraints and demand for expansion capital. In particular, with federal requirements increasing the nation's automobile fuel efficiency standards to 54.5 miles per gallon in 2025, we recognize the need for suppliers to accelerate investment in the manufacture of key fuel efficiency technologies.

As a result, the Department recently announced a number of steps it is taking to improve the ATVM program in order to help support domestic advanced

vehicle and component manufacturing. The Department will continue to accept applications and issue loans until the loan authority has been expended, as established by Congress in the Energy Independence and Security Act (EISA) of 2007.

The Department takes its responsibility to protect taxpayers' interests very seriously. All applications must undergo a rigorous due diligence process to ensure that there is a reasonable prospect of repayment. We also have strong portfolio management practices after the loan is approved to further safeguard taxpayers from the risk of a company being unable to meet its obligations.

In the case of Fisker, the Department stopped disbursements to the company in June 2011 after it fell short of the milestones that we had established as conditions of the loan. As a result, while our original loan commitment was for $529 million, only $192 million was actually disbursed. Further, the Department has now recouped $53 million of the $192 million that was disbursed to Fisker as part of its loan commitment. Overall, the performance of the DOE's ATVM portfolio has been strong.

NEW FOSSIL ENERGY PROJECTS SOLICITATION

Subcommittee. Mr. Secretary, I was pleased to see that the Department recently announced a solicitation to make available the entire $8 billion of loan authority for Advanced Fossil Energy Projects. Yet, I feel a little bit of déjà vu. This is the second time that the Department has announced an $8 billion solicitation for these projects. The first time around, $0 was actually given out in loans.

Why were the previous applicants never offered a loan?

Are any of these applications still active? Would they qualify for the new solicitation?

How is this solicitation different? What did you learn from the first solicitation and how did that change any of the criteria or focus of this solicitation?

I understand that the application costs can be considerable for potential projects. How do these application costs rank against other solicitations from the Loan Programs Office?

The loan guarantee authority is available until expended, yet, I fear that without a backstop some of these applications may linger during the application process. Does the Department have any monitoring mechanisms in place to ensure active applications don't decay in the queue?

Secretary Moniz. In 2008, the Department issued a solicitation for fossil energy projects focused on coal based power generation and industrial gasification facilities that incorporate carbon capture and storage. However, the subsequent drop in natural gas prices dramatically changed the economics for many of these projects causing the majority to voluntarily withdraw their applications.

The remaining three applications from this initial solicitation are still considered pending by the Department. They are being given the same due process as all loan guarantee applicants.

If any of the applicants from the previous solicitation succeed in reaching a conditional commitment for a loan guarantee, it would utilize a portion of

the remaining $8 billion in loan guarantee authority for advanced fossil energy projects.

Since the applications were received, LPO staff have been in regular communication with the applicants and procedures are in place to ensure regular updates for active projects or identify projects that have not proceeded and require additional information for due diligence.

Most recently, the Department issued a new Advanced Fossil Energy Projects Loan guarantee Solicitation in December 2013. The new solicitation has a broader scope, covering all fossil fuels and a broader set of technology. The Department has already received Part I applications under this solicitation and is processing those applications. It also expects to receive additional applications under future submission deadlines.

REMAINING LOAN AUTHORITIES

Subcommittee. Mr. Secretary, I understand that an additional $12 billion of loan authority remains for nuclear projects.

Do you plan to announce a funding opportunity to use the remaining authority for nuclear projects in the near future?

Can you update the Committee on the progress of the two nuclear reactors currently supported by the Loan Programs Office? When will construction be completed?

I understand that the conditional commitment contained $8.3 billion in loan guarantees yet you were only able to issue $6.5 billion to the project in February. Can you update the Committee on the Department's efforts with the remaining project partner and why they have yet to receive the rest of the commitment?

Secretary Moniz. The Department's Loan Programs Office is evaluating whether to issue a future solicitation to allow new applications for either all, or a portion, of the remaining nuclear energy loan guarantee authority.

Georgia Power Company regularly reports Vogtle Units 3 and 4 construction progress to the Georgia Public Service Commission and Department monitors construction progress as part of administering the loan guarantee.

In March, GPC installed the largest AP1000 module, the 2.2 million pound CA20 which houses the reactor spent fuel pool into the Unit 3 nuclear island. GPC's February 2014 report covering progress in 2013 reported significant visible progress building both Unit 3 and 4 nuclear islands, which house the Westinghouse AP1000 reactors. Construction of Unit 3 turbine island and cooling towers have achieved significant vertical elevation. Progress reports indicate that the project is approximately fifty percent complete. GPC reports AP1000 Unit 3 commercial operations could be in fourth quarter 2017 and Unit 4 a year later.

While a specific timeline is unavailable, the Loan Programs Office continues to work with the Municipal Electric Authority of Georgia (MEAG) towards closing on the remaining $1.8 billion loan guarantee for the Vogtle project.

IVANPAH SOLAR ENERGY GENERATING SYSTEM

Subcommittee. Secretary Moniz, in February I followed your announcement of the Ivanpah Solar Energy Generating System in Southern California with great interest. I understand that this particular project was the result of the Department of Energy partnering with many multinational companies.

I understand that there are 4 other concentrating solar power projects that have also received loan guarantees. Is the level of multinational company involvement similar in the other projects as it occurred in Ivanpah?

How does the Department weigh their involvement in these public-private partnerships when there is clearly a high level of private support? What do you think is the Department's proper role?

Secretary Moniz. The project team for the Ivanpah Solar Energy Generating System includes a number of multinational companies, including Google, NRG, Bechtel, and BrightSource.

Before issuing a loan guarantee, the Department requires successful applicants to secure sufficient equity investment in the project and demonstrate the necessary project expertise. This is important to ensure that project developers are adequately invested in the success of the project and have the experience necessary to complete these complex construction projects on time and on budget.

The four other CSP projects that received loan guarantees under the Section 1705 have the same features and requirements.

SCIENCE

OFFICE OF SCIENCE – U.S. GLOBAL POSITION

Subcommittee. Mr. Secretary, the United States has invested heavily in science research over the last half-century. During that time, this investment has played a critical role in creating jobs here at home and ensuring that we have the world's leading science and engineering workforce. It has also brought great benefits to Americans, and the entire world, by producing breakthroughs and innovations behind everything from cell phones to high-yield crops to biotech medicines.

How does this year's budget request affect our standing in the global competition for science leadership? What real, specific advances in science does this budget help the United States achieve?

Secretary Moniz. Every element of the Office of Science budget request is intended to advance U.S. leadership in its particular topical area. In general, the U.S. has leadership in many areas, but unlike the past many decades, the world has caught up or is catching up. Below I provide a short summary of budget highlights from each of the six major science programs with the international context in mind.

ASCR – The request sustains U.S. leadership status in applied mathematics and computer sciences research, in high-performance computing (HPC) for science and engineering and in networking R&D. The request includes a substantial investment in "capable" exascale R&D to position the U.S. for sustained leadership in HPC, extending capability significantly beyond today's petascale computers to address the next generation of scientific, engineering, and large-data problems. The goal of the exascale computing effort in Science is to provide the forefront computing resources needed to meet and advance the Department's science missions into the foreseeable future, as well as providing vital tools for scientific and technological development, economic growth, and national security to maintain U.S. leadership.

BES – The U.S. has world leading status in materials chemistry, catalysis, and condensed matter and material physics. We are currently leading, but the rest of the world is catching up fast, in a number of areas including x-ray, neutron, and electron beam scattering, and aspects of materials science and

chemistry. The budget request includes a research activity in computational materials science to overcome the need to pay for access to foreign software; we not only have no control over the source code, but also these codes are not optimized to run on our massively parallel supercomputing user facilities. The budget also invests in key upgrades to two x-ray light sources, as well as provides support for optimal operations at the BES user facilities, to advance U.S. leadership in those areas.

BER – The request includes investments that will sustain U.S. global leadership in synthetic biology for plants and microbes; plant and microbial ecosystems; systems biology relevant to energy and the environment; and cloud and aerosol observations.

FES – The budget request includes strong facility operations and research programs at the DIII-D tokamak user facility and the newly upgraded National Spherical Torus Experiment (NSTX) user facility; these major facilities are keys to continuing U.S. leadership in magnetic confinement fusion. The request also supports operations at the Materials in Extreme Conditions end station at the Linac Coherent Light Source, which positions the U.S. to lead in certain, key areas of high energy-density physics. The request also enhances research programs at the Princeton Plasma Physics Laboratory (PPPL) in plasma and fusion sciences, and includes $25M in infrastructure funding for the laboratory; PPPL is the sole program-dedicated lab for the FES program. The request also sustains U.S. leadership in measurement and detector science for monitoring what is happening inside a fusion device, and theory, modeling, and high-performance computing simulation to model plasmas under a variety of conditions.

HEP – The request supports the operation of the Fermilab accelerator complex to produce neutrino beams. Two new neutrino experiments, NuMI Off-axis Neutrino Appearance (NOvA) and Micro-Booster Neutrino Experiment (MicroBooNE), will take their first full year of data in FY 2015. The Cosmic Frontier program features a number of leading current efforts and new world class initiatives. The Dark Energy Survey which began operations in September 2013 is the largest astronomical survey dedicated to the study of dark energy. The Large Synoptic Survey Telescope is now under construction and will continue U.S. leadership in this area in the coming decade. At the Energy Frontier, U.S. research groups continue to play leading roles at the Large Hadron Collider, both in research and in

planning for accelerator and detector upgrades. The request supports these activities.

NP – The U.S. is a world leader in hadron physics because of our work at the Continuous Electron Beam Accelerator Facility (CEBAF) and the research on polarized proton collisions at the Relativistic Heavy Ion Collider (RHIC). Completion of the 12 GeV upgrade project at CEBAF is necessary for maintaining world leadership in this scientific thrust, and the budget request fully supports that project. The U.S. is presently one of the world leaders in nuclear structure and astrophysics research through experiments at the Argonne Tandem Linac Accelerator System (ATLAS). In addition, the Facility for Rare Isotope Beams (FRIB), which is entering its peak construction phase under this budget request, will position the U.S. to become the international leader in this area of science.

Subcommittee. Since so much of cutting-edge science seems to rely on such expensive machines that often require contributions from many countries, how should we think strategically about positioning this country to maintain global scientific leadership?

Secretary Moniz. The budget request provides the resources for the Office of Science to successfully deliver our highest priority investments in new and upgraded user facilities while continuing to serve today's mission needs. The decades-long history of the Office of Science shows that both research programs and facilities have been terminated in order to pursue the most promising new investments in research, tools, and major facilities. Recent budget requests demonstrate the Office of Science's willingness to make the difficult decisions to close long-running user facilities in order to realize new investments reflecting scientific priorities: in recent years the Office of Science closed the Tevatron at FNAL, the Holifield Radiation Ion Beam Facility at ORNL, and the Intense Pulsed Neutron Source at ANL. In this way we can sustain U.S. leadership in our areas of highest priority without skewing the balance among research, facility construction, and facility operations.

ARPA-E

ARPA-E MANAGEMENT AND FUNDING STRUCTURE

Subcommittee. Mr. Secretary, the fiscal year 2015 budget request provides strong support for the Advanced Research Projects Agency – Energy ("ARPA-E"). Although still a young agency, ARPA-E has seen considerable broad bipartisan support, largely for its active project management and flexible funding structure.

Can you discuss the value of ARPA-E to the Department's applied research portfolio? What are some specific innovations that have come out of ARPA-E during the last few years?

Secretary Moniz. Over the past five years, ARPA-E has played a critical role in answering the President's call to develop a domestic, all-of-the-above approach to produce, store, and use energy. To date, ARPA-E has invested over $900 million across 362 projects through 18 focused programs and two open funding solicitations (OPEN 2009 and OPEN 2012). In the past year alone, ARPA-E has launched focused programs to improve techniques to manufacture light-weight metals, develop robust battery chemistries and architectures for electric vehicles, biologically convert natural gas to liquids, create innovative semiconductor materials for improved power conversion, and use solar concentration techniques for hybrid solar converters. The Advanced Research Projects Agency-Energy (ARPA-E) advances high-potential, high-impact energy technologies that are too early for private-sector investment.

The success of ARPA-E programs and projects will ultimately be measured by impact in the marketplace. As the projects ARPA-E funds seek to create transformational energy technologies that do not exist today, ARPA-E looks at various metrics to measure progress towards eventual market adoption. The primary metrics are the individual project and program milestones, which are reviewed quarterly, while more broadly, technical success is measured by indicators such as patents and publications. Most importantly, ARPA-E gauges success by project handoffs, including the formation of new companies and fostering public and private partnerships to ensure projects continue to move towards the market, as well as formation of new communities. To date, 22 ARPA-E projects have attracted more than $625 million in private-sector follow-on funding after ARPA-E's investment of

approximately $95 million. In addition, at least 24 ARPA-E project teams have formed new companies to advance their technologies, more than 16 ARPA-E projects have partnered with other government agencies for further development, and at least 4 technologies funded by ARPA-E are in preliminary commercial sales.

As of April 2014, ARPA-E has already experienced several notable technical breakthroughs. A few of these include:

- An ARPA-E funded project is developing a grid-scale flow battery for energy storage. At the Marine Corps' base in Miramar, California, they are building a micro-grid to allow the base to be powered by solar energy during the day, while storing enough energy to power the base for 72 hours.
- Another storage project has developed low-cost, non-toxic, carbon-based molecules used to store energy in grid scale flow batteries that could help reduce the cost of energy storage from $400 to less than $100 per kilowatt-hour stored and allow the battery to last through 10,000 charge and discharge cycles.
- A research team has developed a 600V Gallium Nitride (GaN) transistor switch that has enabled the world's first GaN-based high power, low-cost converter for a variety of applications, including electric vehicle motor drives, solar panels, air conditioners, and data centers.
- An ARPA-E funded project has developed a device that clamps onto existing transmission lines to control the flow of power on the gird, which help route power, similar to the way computer routers direct traffic across the internet. The team is working with a utility company to test 99 of these devices on a 161-kilovolt transmission corridor spanning 17 towers to automatically reroute electricity from congested transmission lines.

Subcommittee. This year's budget request supports the agency's third "OPEN" solicitation, whereby ARPA-E looks for the most promising and transformative technologies out there, whether they fit into a specific target category or not. Can you discuss the benefits of this particular solicitation?

Secretary Moniz. ARPA-E seeks out transformational, breakthrough technologies that show fundamental technical promise but are too early for private-sector investment. ARPA-E ensures that potentially transformational

ideas outside the scope of existing "focused" programs are not lost by utilizing "open" funding opportunity announcements. Projects selected under the "open" solicitations address the full range of energy-related technologies and concepts and meet technical needs not addressed by other parts of ARPA-E, the Department of Energy, or the private sector.

In a "focused" program, ARPA-E invests in a diverse portfolio of technical approaches to meeting a program's metrics. The "Open" FOA may enable ARPA-E to explore discrete ideas not currently being explored by government, universities, or the private sector. Often, the idea may be too unique to support the complimentary competing projects necessary to launch a "focused" program and thus would slip through the cracks without ARPA-E investment in an "Open" FOA.

Subcommittee. One of the unique things about ARPA-E is its full funding of awards and active project management, which enables the agency to remain on the cutting-edge of research, even in constrained budget cycles. This keeps the agency from having to use several years' worth of appropriations to fund the same solicitation, when technologies might become stale or out-of-date from one year to the next.

Can you discuss how the full funding of awards, typically $3 million to $5 million, has helped ARPA-E?

Secretary Moniz. ARPA-E programs are created to address critical challenges in energy innovation—ARPA-E has the expertise to identify these gaps and the flexibility to rapidly address them. ARPA-E's model of forward-funding projects maximizes the agency's agility. This agility lets the Agency move into new technical areas and react quickly to changes in the market.

Forward funding our awards in full empowers ARPA-E's award recipients to focus on their research without worrying about future budget uncertainty and allows the agency to look to the future at the start of each budget cycle.

Lastly, as you know, ARPA-E actively manages the projects and will terminate an under-performing project and reassign the remaining funds to other ARPA-E projects.

Subcommittee. Is this something you would support implementing across the Department's science and research programs for small awards, like ARPA-E's, where appropriate?

Secretary Moniz. Forward-funding awards has many pros and cons and may not be right for other Department agencies. We will continue to examine where we can replicate ARPA-E's approach and success within the Department.

POWER MARKETING ADMINISTRATIONS AND HYDROPOWER

RELATIONSHIP WITH POWER MARKETING ADMINISTRATIONS

Subcommittee. The four power marketing administrations have long operated as distinct entities within the Department of Energy. Certain recent activities, however – such as the March 2012 memo issued by your predecessor, Dr. Chu – have raised concerns among some ratepayers and Members of Congress that the Department is trying to alter that long-standing relationship in order to establish more of a top-down, Washington-based management structure.

Mr. Secretary, could you please describe your view of the appropriate role of the Department in relation to the PMAs?

Secretary Moniz. The Department of Energy (Department) respects the unique statutory authorities of the Power Marketing Administrations (PMAs), as well as the importance of the existing collaborative relationships among the Department, the PMAs, and their customers. Our goal is to strengthen how we work together.

Each PMA must and will work collaboratively with their preference power customers, transmission customers, tribes, stakeholders, and industry peers to ensure the continued compliance with the mission and goals set forth in their statutes to maintain their day-to-day obligations.

QUESTIONS FROM CHAIRMAN SIMPSON

VISION FOR THE DEPARTMENT OF ENERGY

Chairman Simpson. Mr. Secretary, one of the things which has bothered me ever since I joined Congress is how frequently and dramatically agencies change directions at the end of Administrations or when Secretaries change. This is a challenge which you may not be able to really help me with, but I'd like you to take as much time as you need to describe to us YOUR vision for the Department of Energy.

Secretary Moniz. There are two key pillars around which I can frame my vision for the Department of Energy. First, the ultimate strength of the Department of Energy across all of its missions is that it is a science and technology powerhouse. It is the development and application of science and technology, including harnessing the capabilities of our national laboratory system, although not exclusively, that enables DOE to achieve its missions. Second, and it is my hope that this will have an enduring impact on the Department, through the recent reorganization of the Department under three new Under Secretaries, we have emphasized three commitments to the American people: 1) an energy-science agenda; 2) the safety and reliability of the nuclear weapons stockpile without testing; 3) and superior management and performance.

As I noted in my testimony, the President is committed to an all-of-the-above energy strategy and I wholeheartedly share this vision. The global energy landscape has undergone a profound change since the President took office. We are producing more natural gas in the U.S. than ever before. And for the first time in decades, we are producing more oil at home than we import from the rest of the world. At the same time, renewable energy generation from wind, solar, and geothermal sources has doubled (relative to a 2008 baseline) and carbon emissions in the U.S. have fallen to the lowest level in nearly two decades. These changes have important implications for national security, the economy, and the environment. The risks of global climate change alone threaten the health, security, and prosperity of future generations. To mitigate those risks, and prepare for their potential impacts, the Department of Energy has taken a lead role in implementing the President's Climate Action Plan. Among the Climate Action Plan's many initiatives, DOE has put its research, development and deployment muscles to work to implement appliance efficiency standards, promote safe, new

designs for small modular nuclear reactors, and champion preparedness and resilience planning across the U.S. energy sector, among many other actions.

I believe, as the President has stated, we have to move forward on fossil, nuclear, renewables and energy efficiency, all with a view towards a future clean energy economy. As such, DOE must continue to support a broad research and development portfolio of clean energy options and key enablers: energy efficiency, renewables, nuclear energy, carbon capture and sequestration, energy storage, and smart and reliant grids. While Administrations may have different emphases in different areas, it is important to sustain a broad portfolio for the long-term.

The DOE science program provides the technical underpinnings to accomplish the Department's missions and is the largest federal funder of basic research in the physical sciences in the U.S. The DOE's proposed investment in science in FY 2015 supports 22,000 researchers at 17 national laboratories and more than 300 universities. In my view, it is paramount that DOE maintain for the long term, its longstanding and very successful support for the physical sciences and engineering in this country. I am also committed to working with the scientific community and Congress to assure that researchers have continuing access to our cutting edge research tools and many user facilities. Lastly, to ensure a comprehensive vision and integration between the science and technology missions, I have combined the basic research and applied energy activities under a single Under Secretary.

To achieve this vision requires an enduring approach to energy policy formulation and execution based on a rigorous planning process and analysis. The President has established the Quadrennial Energy Review (QER), the need for which I fully supported as a former member of the President's Committee of Advisors for Science and Technology. Launched earlier this year, the QER is designed to address the challenge of leveraging America's domestic energy resources while strengthening energy security, sustainability, and economic growth. DOE led by the Office of Energy Policy and Systems Analysis, in coordination with agencies across the federal government, will use the QER to help U.S. policymakers across all energy sectors make decisions based on unbiased data and rigorous analysis. The first QER Report, due in January 2015, will focus on energy infrastructure and resilience, and will provide recommendations around the nation's infrastructure for transmitting, storing and delivering energy, with

later reports likely covering other aspects of the energy sector. The effort is being broadly informed by strong input from Congress and private sector stakeholders.

The second commitment of the Department is to provide for the safety, security and effectiveness of the nuclear stockpile without testing, reduce the global danger from proliferation of nuclear weapons and materials, and provide the U.S. with effective nuclear propulsion. In March, speaking at The Hague, President Obama reiterated his commitment to nuclear nonproliferation and security, calling on the global community to decrease the number of nuclear weapons, eliminate and control nuclear weapons-usable materials, and support a sustainable and secure nuclear energy industry, all areas central to the DOE mission. We must meet our commitments to the Department of Defense in nuclear security by maintaining a safe and reliable stockpile, without testing, while also working to reduce the numbers and types of weapons in the next two decades. As you know, the President nominated Retired Air Force Lt. General Frank Klotz, who was recently confirmed by the Senate and sworn in to serve as the new Under Secretary and Administrator of the National Nuclear Security Administration.

In addition, the Department draws heavily on the expertise and distinctive capabilities of its 17 national laboratories for mission accomplishment. I have spoken extensively about my desire to improve alignment between the Department and its national laboratories. This is a focus of the new Laboratory Policy Board and Laboratory Operations Board which I have established, and also the Secretary of Energy Advisory Board. I have also stated my desire to return to an optimized structure for the national laboratories that provides quality and value for DOE and the nation, and I will be working with the laboratories to do so.

Finally, as I have said on the issue of management and performance within DOE, the Department needs to improve the rigor and discipline within which it operates. I have made a number of changes that I believe will improve efficiency and effectiveness, including aligning the Department's project management and other administrative resources along with the Office of Environmental Management (EM) under a single Under Secretary for Management and Performance. As you know, the Department is engaged in the cleanup of the many sites involved in decades of nuclear weapons production and civilian nuclear energy research and development.

While the EM has successfully cleaned up 91 sites, some of the most complex and highest risk work remains. I have been personally engaged with a Headquarters-field team in setting a new course for completing the Waste Treatment Plant in Hanford, the largest and most complex cleanup project in the country. Based on a phased approach it would enable DOE to begin processing low activity waste in the nearer term while efforts are underway to address technical issues that caused DOE to suspend construction on portions of the plant.

As part of our efforts to improve effectiveness and efficiency of Departmental operations, I have also announced the reorganization of the Department's independent oversight and security, safety, health and environmental policy and support operations. This includes the alignment of the safety, security, and health policy and support functions under the Under Secretary for Management and Performance, creation of new Chief Security Officers within each of the three Under Secretary offices, a cross-cutting security policy committee comprised of these Chief Security Officers and chaired by the Associate Deputy Secretary, and the reporting of the new Office of Independent Enterprise Assessments directly to me.

KEEPING MANUFACTURING JOBS IN THE UNITED STATES

Chairman Simpson. This subcommittee has long supported the Department's efforts to keep the world's best science and engineering workforce here at home, and to keep our position as the world's top innovator. But we also need to think one step further by making sure we don't just invent the newest technologies, but that we then manufacture them in the United States. After all, devoting federal funding to support a research team of 10 people here at home just so a company can support 1000 manufacturing jobs overseas misses the mark.

Secretary Moniz, beyond the Advanced Manufacturing program your budget proposes, how are you working to ensure that federally-funded research and development conducted at American universities, labs, and companies then leads to manufacturing and jobs here in the United States?

Secretary Moniz. DOE-supported investments can help bring together manufacturers, suppliers, and universities and research institutions to develop and de-risk foundational technologies that will allow U.S. manufacturers to keep their competitive advantage in the production of products for the clean energy economy, and develop high-impact manufacturing technologies that increase energy productivity for traditionally energy-intensive industries and across the board. With industry's input, the Department has identified a variety of activities that could help U.S. manufacturers remain competitive in the clean energy economy. For example, developing next-generation foundational technologies, like advanced composite materials and structures or wide bandgap power electronics, can enable the manufacture of low-cost, high-performance products with broad applicability for manufacturers in clean energy industries. Furthermore, DOE-supported technical assistance activities help U.S. manufacturers reduce their energy consumption and boost their energy productivity by leveraging technical expertise to deploy energy-efficient manufacturing processes, technologies, and practices. In FY 2015, the Department is requesting $554 million for RD&D activities across our Advanced Manufacturing, Vehicles, Bioenergy, Solar, Wind and Water, Buildings, and Fuel Cell Technology Offices to increase the energy efficiency, productivity, and competitiveness of U.S. manufacturing.

DOE recognizes the many benefits of U.S.-based manufacturing within the clean energy economy, including job creation and high-tech intellectual

property generation. For example, motivated in part by this Committee's report language, starting in FY 2014, EERE has successfully built into its standard operating procedures, and where appropriate: the requirement that applicants to EERE competitive Funding Opportunity Announcements submit U.S. manufacturing plans as a component of their applications (or agree that subject inventions be substantially manufactured in the U.S.); the requirement that EERE consider U.S. manufacturing plans when evaluating applications; and the requirement that EERE negotiate, track, and enforce U.S. manufacturing commitments as part of its cooperative agreements. These efforts will help foster U.S. innovation, strengthen manufacturing competitiveness, and provide our research partners the assurance that the Department is dedicated to supporting U.S. manufacturers.

DEPARTMENT OF ENERGY LOAN AND LOAN GUARANTEE PROGRAMS

Chairman Simpson. Mr. Secretary, the Department's loan guarantee program has had a controversial history and was essentially dormant for a year before you became Secretary. Since you have taken your position, however, there have been developments – some positive, and some which raise questions.

First, finalizing the Vogtle loan guarantee was a big step forward in the right direction. Russia's actions in Ukraine remind us that having a diversified energy portfolio is strongly in our national interest, and a domestic nuclear energy capability is a component of that. Thank you for your hard work.

In January, however, you announced that you were considering expanding the ATVM program to suppliers. I'm sure that the nearly $16 billion in existing loan authority in this program is an attractive source of funding, but the state of the domestic auto industry today is significantly better than in 2009 when this program was first funded. Just because funding is available does not mean it should be spent. How would you convince this subcommittee that resurrecting this program in 2014 is a wise move?

Secretary Moniz. The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program has supported the production of over 4 million cars and approximately 35,000 direct jobs across eight states, including California, Illinois, Michigan, Missouri, Ohio, Kentucky, New York and Tennessee. To date, the program has issued more than $8 billion in loans including successful loans to Ford Motor Company, and Tesla Motors.

While the economics of the automotive sector have improved, conversations with motor vehicle parts manufacturers highlight strong sector growth that is leading to capacity constraints and demand for expansion capital. In particular, with federal requirements increasing the nation's automobile fuel efficiency standards to 54.5 miles per gallon in 2025, we recognize the need for suppliers to accelerate investment in the manufacture of key fuel efficiency technologies.

The Department believes that the ATVM program is still necessary to support the 'in-sourcing' of U.S. manufacturing, address credit constraints

that still remain in the auto industry, and ensure that advanced vehicle technology that is developed in the U.S. is manufactured in the U.S.

APPLIANCE STANDARDS AND PRESIDENT OBAMA'S "YEAR OF ACTION"

Chairman Simpson. Mr. Secretary, in this year's State of the Union address President Obama declared 2014 as a "year of action" in which he pledged to sidestep Congress "whenever and wherever" necessary. This means the President plans to implement his priorities through regulations and rule-making on things that Congress won't do.

Mr. Secretary, can you discuss what your Department is doing to sidestep Congress and move forward with the President's priorities in this "year of action"?

Secretary Moniz. At the direction of laws passed by Congress, the Department of Energy is required to develop, revise, and implement minimum energy conservation standards for appliances and equipment. The Department will continue to work with Congress, industry and stakeholders to develop regulations to save U.S. consumers money, reduce carbon pollution, and provide manufactures with a single federal standard, as opposed to a potential patchwork of state standards.

Chairman Simpson. Mr. Secretary, your Department is moving much more aggressively on additional appliance and equipment standards, particularly within the context of the President's Climate Action Plan, to reduce the amount of energy we consume on a systemic basis. Just last month we saw proposals to revise regulations for walk-in coolers, freezers, and commercial boilers.

Can you discuss what rules you're considering – whether draft or final – and what we're likely to see coming down the pike in the next year?

Secretary Moniz. The Department of Energy (DOE) sets minimum energy efficiency standards for approximately 50 categories of appliances and equipment used in homes, businesses, and other applications, as required by existing law. DOE regulations governing covered appliances and equipment are established through a rulemaking process that provides opportunities for public review and comment. For most products, Congress passed laws that set initial federal energy efficiency standards and test procedures, and that established schedules for DOE to review and update these standards and test procedures. National model building energy codes

for commercial and residential buildings are developed and updated through industry consensus processes including representatives of industry, builders, the government, general public, or any interested stakeholder. FY 2015 planned final rules include:

- Commercial clothes washers
- Commercial ice makers
- General service fluorescent and incandescent reflector lamps
- High-intensity discharge lamps
- Commercial furnaces
- Residential boilers
- Single package vertical air conditioners and heat pumps
- Packed terminal air conditioners and heat pumps

Chairman Simpson. Can you provide this Committee with a list of regulations the Department is currently seeking action on?

Secretary Moniz. The Department is currently engaged in standards rulemakings for the following appliances and equipment:

Computers and Related Equipment
Portable Air Conditioners
Commercial Packaged Boilers
Refrigerated Beverage Vending Machines
Hearth Products
General Service Lamps
Residential Boilers
Ceiling Fans and Ceiling Fan Light Kits
Commercial and Industrial Pumps
Commercial and Industrial Fans and Blowers
Miscellaneous Residential Refrigeration
Dehumidifiers
Packaged Terminal Air Conditioners and Heat Pumps
Commercial Compressors
GSFL and Incandescent Reflector Lamps
High Intensity Discharge Lamps
Automatic Commercial Ice Makers
Commercial Clothes Washers
Single Package Vertical Air Conditioners and Heat Pumps
Residential Water Heaters (Grid-Enabled)
Commercial Packaged Air Conditioners and Heat Pumps
Commercial Warm-Air Furnaces

Commercial Water Heaters
Battery Chargers
Furnace Fans

Chairman Simpson. What do you see as the proper role of government in setting these standards? Can you discuss your general rulemaking process on how these regulations impact industry and businesses?

Secretary Moniz. The Department of Energy (DOE) sets minimum energy efficiency standards for approximately 50 categories of appliances and equipment used in homes, businesses, and other applications, as required by existing law. For most products, Congress passed laws that set initial federal energy efficiency standards and test procedures, and that established schedules for DOE to review and update these standards and test procedures. DOE's minimum efficiency standards significantly reduce U.S. energy demand, lower emissions of greenhouse gases and other pollutants, and save consumers billions of dollars every year, without lessening the vital services provided by these products. The appliances and equipment addressed in standards provide services that are used by consumers and businesses, such as space heating and cooling, refrigeration, cooking, clothes washing and drying, and lighting. In addition, DOE implements laws designed to limit the water consumption of several plumbing products.

DOE's general rulemaking process is a well-defined, stakeholder-driven public process that was established by DOE's "Process Rule." The "Process Rule," among other things, established a timeline for public documentation of all analyses relating to the product standard as well as public comment on these analyses. With the establishment of the Appliance Standards and Regulatory Federal Advisory Committee (ASRAC), DOE has recently become more active in negotiated rulemakings, which allows stakeholders and DOE the opportunity to establish a new or amended Federal energy conservation standard in a negotiated fashion.

OFFSHORE LNG TERMINALS:

Chairman Simpson. DOE has the authority to determine when it is in the public interest to export LNG to non-free trade agreement countries. Some of these projects must apply through FERC and, if off shore, go through the DOT's Maritime Administration for safety approvals.

Your Department has received numerous congressional bipartisan inquiries into the backlog of these permits. Is there a plan in place to set up a process that allows LNG export applications for FERC and off-shore to be considered simultaneously? If not, what is your plan and what kind of timetable can we expect for these permits to be considered?

Secretary Moniz. DOE's role with respect to LNG exports to non-free trade agreement countries is to consider whether the proposed exports are in the public interest pursuant to Section 3(a) of the Natural Gas Act and either to approve or deny the proposed exports on that basis. While DOE is responsible for export of the natural gas as a commodity, other agencies are responsible for approving the siting and construction of LNG terminals: pursuant to Section 3(e) of the Natural Gas Act, the Federal Energy Regulatory Commission (FERC) is responsible for proposals to site and construct LNG terminals onshore or in state waters; and, pursuant to Section 3(9) of the Deepwater Ports Act, as amended by Section 312 of The Coast Guard and Maritime Transportation Act of 2012 (Pub. L. 112-213), the Maritime Administration within the Department of Transportation (MARAD) is responsible for LNG terminals located beyond state waters.

Companies seeking to export natural gas from new or modified LNG terminals located onshore or in state waters have typically applied in parallel to both DOE and FERC. This is an efficient approach as it allows both agencies to proceed in their reviews simultaneously rather than sequentially. We believe it would be prudent for companies seeking to export natural gas from LNG terminals located outside state waters also to apply in parallel to both DOE and MARAD. To date, DOE has received two applications to export natural gas from MARAD-jurisdictional facilities. To our knowledge, neither of these applicants have yet applied to MARAD or begun the environmental review process there, although nothing in the applicable statutes or regulations would stop them from doing so.

As of April, 2014,[4] the Department is processing the pending applications to export liquefied natural gas to non-free trade agreement countries on a case-by-case basis as expeditiously as possible in view of the level of appropriate due diligence activities, given that the orders on export applications are complex documents that must withstand public and legal scrutiny. In December 2012, the Department established an order of precedence to evaluate pending applications to export liquefied natural gas to non-free trade agreement countries based in part on the date that the application was filed and in part on whether FERC had authorized the pre-filing environmental review of the related liquefaction project. At that time, DOE had not received any LNG export application to non-free trade agreement countries using off-shore facilities. All subsequent applications were added to the queue in the order each application was received by DOE, whether those associated facilities were FERC or MARAD jurisdictional.

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[4] On May 29, 2014, the Department proposed to review applications and make final public interest determinations only after completion of the review required by environmental laws and regulations that are included in the National Environmental Policy Act review (NEPA review), suspending its practice of issuing conditional commitments. The proposed changes to the manner in which LNG applications are ordered and processed will ensure our process is efficient by prioritizing the more commercially advanced projects, while also providing the Department with more complete information when applications are considered and public interest determinations are made.

The Department's practice of issuing conditional authorizations to export LNG to non-FTA countries was designed to provide regulatory certainty before project sponsors and the Federal Energy Regulatory Commission (FERC) spend significant resources for the review of export facilities required by environmental laws and regulations that are included in the NEPA review. However, market participants have increasingly shown a willingness to dedicate the resources needed for their NEPA review prior to receiving conditional authorizations from the Department of Energy. In response to these and other developments, the Department intends to make final public interest determinations only after a project has completed the NEPA process, instead of issuing conditional authorizations. By removing the intermediate step of conditional decisions and setting the order of DOE decision-making based on readiness for final action, DOE will prioritize the more commercially advanced projects.

The proposed procedural change will improve the quality of information on which DOE makes its public interest determinations. By considering for approval those projects that are more likely to actually be constructed, DOE will be able to base its decision on a more accurate evaluation of the project's impact on the public interest. DOE will also be better positioned to judge the cumulative market impacts of its authorizations in its public interest review. While it is not assured that all projects for which NEPA review is completed will be financed and constructed, projects that have completed the NEPA review are, generally speaking, more likely to proceed than those that have not.

This proposed change will streamline the regulatory process for applicants, ensure that applications that have completed NEPA review will not be delayed by their position in the current order of precedence, and give the Department a more complete understanding of project impacts.

SOLAR GENERATED ELECTRICITY:

Chairman Simpson. The Department's FY 2014 Congressional Budget Request proposes funding for various renewable programs. Solar generated electricity, the fastest growing generating source, appears to have matured to a point that it can stand without further direct or indirect taxpayer-funded subsidies.

The electric grid is a key component to the national infrastructure. The Administration's "All the above" energy policy seems to be prioritizing intermittent renewable power to the grid. Has the Department studied the impact of intermittent energy resources on the electric grid and end use electronics?

Secretary Moniz. The electric grid is facing increasing complexity on several fronts while still being expected to remain reliable and affordable. The Department's focus is to help states and regions manage this transition effectively. Use of "all of the above" generation sources (including distributed energy resources combined with a modernized transmission and distribution infrastructure can make this a successful transition. While solar energy has not yet reached grid parity, to date the Department's SunShot Initiative, together with separate cost-reductions achieved by the foreign and U.S. solar industry, has made 60% progress since 2010 towards its cost reduction goal that would enable solar to be cost-competitive without subsidy by 2020. States and regions vary in the degree that variable resources have entered their electricity systems. DOE is working with many states on electricity issues, including high renewable penetrations in California and Hawaii, where some distribution circuits are facing over 100% PV penetration at low load conditions. The affected systems were not designed for these conditions, and these states and utilities are working with DOE to understand and adapt their systems to balance generation sources to accommodate greater levels of renewables, as well as to address requirements such as cybersecurity, reliability, resiliency and cost-effectiveness. DOE and its industry partners are studying impacts on grid components and operations from both solar and wind, including wind-hydro interactions, grid reliability, renewable resource forecasting, and operational impacts on thermal generation units, such as increased cycling of fossil fuel plants.

As described in the Administration's Climate Action Plan, the President has established a goal to double renewable electricity from wind, solar and geothermal by 2020 in order to increase the diversity and reduce carbon emissions of our electricity generation mix and to ensure America's continued leadership position in clean energy. This new goal to double renewable power follows an initial successful doubling of U.S. renewable power from 2009 to 2012.

In response to all challenges facing the electricity system, the Department has:

- Published several studies addressing the impact of intermittent energy resources including *Renewable Energy Futures*, the *Western Wind and Solar Integration Study*, the *Eastern Wind Integration Study*, and the *Hawaii Solar Integration Study*.
- Provided a grant on interconnection-wide transmission and resource planning to the Western Governors Association, who through its subsidiary body the Western Interstate Energy Board, has sponsored numerous studies and other activities that inform member states, and the western utility industry those states regulate, on actions necessary to reduce the cost and improve the reliability of the large amounts of wind and solar generation now being deployed to meet state renewable portfolio standard laws. Of note is foundational work that has spurred the creation of an "energy imbalance market" in certain portions of the west, whose aim is to lower the cost of integrating currently and soon-to-be-deployed wind and solar generation.
- Chartered a DOE-wide Grid Tech Team to coordinate and plan programs to address grid modernization challenges.
- Increased coordination between key DOE laboratories on grid related issues, building on decades of work at labs like PNNL and ORNL and including the new Energy Systems Integration Facility at the National Renewable Energy Laboratory.
- Studying operational lessons learned and best practices from BPA's and WAPA's experience with a large influx of intermittent resources.
- Requested a robust budget in FY 2015 for grid activities including variable renewables integration.
- The Department views the integration of variable renewable capacity as a high priority issue and has increased work on the subject over the past six years. This includes significant work with the states and

regions on long-term transmission planning under various state- and stakeholder-chosen future scenarios, development of new tools for wind and solar integration in the Western Electricity Interconnection and conducting several preliminary studies investigating the impact of intermittent energy resources on the grid.

Chairman Simpson. Please provide further details about the proposed comparative research on residential solar costs in the United States and other countries. Germany is sited as having hardware systems that are half the costs of those in the United States. Not listed is that cost of electricity in Germany is three times that of the US and that their emissions have increased because of the need to restart older, less efficient generating stations. Will the Department's proposed study include any research into costs to customers?

Secretary Moniz. Addressing the costs associated with solar systems, as technology advances have led to lower solar module costs, soft (non-hardware) costs now make up over half of the cost in commercial systems and an average of 64% of the total cost of installing residential solar in the U.S. Soft costs include design and installation labor, labor invested in executing permitting and interconnection as well as interconnection, permitting, and inspection fees, customer acquisition costs, financing and contracting, operations and maintenance, transaction costs, sales tax, installer/developer profit, and indirect corporate costs.

Programs like the Department's Rooftop Solar Challenge are specifically designed to reduce non-hardware costs; to create replicable, regional solutions that effectively increase access to solar; and to avoid targeting just a handful of cities. Creating standardized best practices, developing replicable solutions and using a regional approach have been shown to create significant cost reductions, because they reduce market fragmentation.

In FY 2015, DOE's SunShot Initiative will continue research and analysis on key areas in reducing the balance of systems costs, including non-hardware costs for solar installations. One such area will be comparative research between residential solar costs in the U.S. and other countries. In FY 2014, a report funded by SunShot compared the soft costs in the US and Germany and found that those costs are four times higher in the US as

compared to Germany.[5] The research revealed installation practices and labor efficiencies that are common with German residential solar installations that are not widely adopted in the US. Better understanding of these differences can help US companies further reduce their costs.

DOE is working to reduce costs of solar energy systems, understand the impact on utility business models, and evaluate consumer interests in order to ensure that U.S. electricity is reliable, affordable, and increasingly clean.

Chairman Simpson. In addition to the soft costs, is the Department also considering the fixed-costs that allow the distributed energy generation systems to stay connected to the electric grid? If not, what is the basis for this exclusion?

Secretary Moniz. The Department of Energy, working with industry, has been working on all aspects of distributed energy resource integration for a number of years, steadily building on developments, demonstrations and analysis to understand distributed energy resources and the impact on grid operations and costs.

For example, DOE funded the development of IEEE 1547, now the world-wide distributed energy grid integration standard, and is continuing to fund modifications to enable increasing levels of all distributed energy resources. Current work also includes reducing the costs of the distributed energy generation; improving asset utilization within the distribution circuits, including demand response; reducing costs of energy storage; and improving grid controls to enable more distributed energy resources.

Chairman Simpson. In its work to assist states and localities in harmonizing and streamlining solar policies, will the Department also be developing guidelines on how to more equitably address the cost-shift that is a result of net-metering policies and rate design? If not, what is the basis for this decision?

Secretary Moniz. The Department is working with states on many issues, including energy assurance, energy efficiency, demand response, smart grid, transmission planning and renewable energy. Policies such as

[5] "Reducing Solar PV Soft Costs," Rocky Mountain Institute and Georgia Tech, December 2013.

net-metering and alternative rate designs are frequently used by states to promote solar. DOE is discussing with the National Association of Regulatory Utility Commissioners (NARUC) and the National Association of State Energy Officials (NASEO) as well as individual state commissioners, working with a diversified group of stakeholders, potential efforts to develop broadly-accepted concepts, methods, and tools that regulators and other decision-makers can use in dealing with the challenges and opportunities associated with the wider deployment of distributed energy technologies, including solar power. This will allow each state access to a set of broadly-accepted tools to help in balancing social equity, grid modernization and rate design decisions. However, the Department does not plan to develop "guidelines" because some stakeholders could perceive them as unduly intrusive or prescriptive to state authorities.

QUESTIONS FROM MRS. LOWEY OF NEW YORK

PHYSICAL SECURITY OF THE ELECTRICITY GRID

Mrs. Lowey. Last April, there was a shooting attack outside of a San Jose, California substation in which gunmen shot 17 large transformers in 19 minutes. Thank fully, customers didn't lose electricity because power was rerouted around the damaged substation, but it took utility crews 27 days to fully repair the substation at a cost of over $15 million dollars.

As a result of the attack, FERC has ordered the North American Electric Reliability Corporation (NERC)* to develop physical protection standards, particularly those at critical substations, since federal rules don't currently regulate the security of electric substations except those at nuclear power plants.

Did any organization at the Department of Energy consult on this event?

Secretary Moniz. The Department supported the investigation and lessons learned process after this event. DOE coordinated with Department of Homeland Security (DHS) and FERC following notification of the incident. The Department sent staff from the Office of Electricity Delivery and Energy Reliability (OE) to California soon after to meet with the FBI office leading the investigation, Pacific Gas & Electric (PG&E), and Lawrence Livermore National Laboratory (LLNL) to receive a briefing of the incident and an update on the investigation. LLNL was consulted by PG&E to do an assessment and analysis of the security of the Metcalf substation and a number of other critical PG&E substations soon after the incident.

Mrs. Lowey. Is your office playing any role in assisting NERC to develop physical protection standards and do you anticipate working with FERC to begin a formal rulemaking process to implement the recommendations?

Secretary Moniz. The ability to invoke mandatory standards is governed by statutory authority, and that responsibility lies with FERC. DOE does not have an active role in participating in the regulatory standards processes. The current standards development process is industry-led, directed by NERC. Government agencies participate as observers as part of

the drafting team. DOE-OE has provided staff to serve as an observer on this drafting team.

Mrs. Lowey. Are there any funds in this budget request to support those efforts, and how would you propose to spend additional funds if they were provided?

Secretary Moniz. The Department used existing OE staff and travel resources to support the Physical Security Awareness Campaign, where owners, operators, state and local governments, and law enforcement were provided threat briefings.

Mrs. Lowey. As a result of that shooting incident, (FERC) commissioned a study, which found that the entire U.S. electricity grid could be brought down by taking out just nine critical electric-transmission substations, out of the country's nearly 55,000. In one scenario involving highly coordinated small-scale attacks, FERC concluded the entire U.S. grid could be brought down for at least 18 months by destroying nine interconnection substations.

Reports like these underscore the risks associated with our current centralized power infrastructure and the need to integrate the electricity grid.

Can you discuss the Department's efforts to integrate the grid and to protect it against physical attack?

Secretary Moniz. FERC's analysis is a valuable first step in analyzing the physical security needs of the U.S. electric grid. Models have limits, however, and FERC applied static planning models to represent a dynamic operational problem; the results are illustrative but not definitive. Therefore, the results are best used as an input to a collaborative process among industry, and oversight organizations, to identify physical and cyber security threats, vulnerabilities, and impacts.

As part of the Department's responsibility as the Sector Specific Agency, we are working with the Power Marketing Administrations and the Sector Coordinating Councils to develop a regionally based resiliency approach to analyze criticality, identify vulnerabilities, and conduct a combined physical and cyber risk-threat assessment. Additionally, DOE and DHS (in coordination with the FBI, FERC, NERC, the Electricity Sector Information

Sharing and Analysis Center (ES-ISAC) partners, and industry experts) co-led a physical security awareness campaign in 10 cities across the country. There, owners, operators, state and local governments, and law enforcement were provided threat briefings. This outreach was in response to the recent acts against the energy sector. These briefings raised awareness and provided industry and state and local law enforcement an overview of the evolving threat, as well as an understanding of available tools, resources, and best practices designed to enhance information sharing, physical security, and resilience.

Mrs. Lowey. Does the U.S. have an interagency process that adequately mitigates the risks to our current electricity grid?

Secretary Moniz. DOE is leading a significant effort, in coordination with the interagency, DOE National Laboratories, academic institutions, and the private sector, to (1) identify the most critical infrastructure, (2) identify the vulnerabilities and risks to those infrastructures, and (3) identify mitigation measures.

In particular, the Department of Energy and its Laboratories, DHS, the Department of Defense, FERC, and the North American Electric Reliability Corporation (acting as the Electric Reliability Organization approved by FERC), are the primary Federal entities working to share with the owners and operators risks to its infrastructure.

Each entity is conducting analyses for their areas of responsibility. For the example, DOE focuses on energy infrastructure systems that power major population hubs and critical facilities; DHS is focused on infrastructure that is most critical for National Security; and DOD is looking for energy infrastructure that supports military installations.

In addition, DOE is providing threat briefings to the industry and directly engaging industry CEOs and Executive leadership across the electricity, oil and natural gas sectors through the Sector Coordinating Councils. Our engagement is not just related to significant events but rather an ongoing dialog on and the importance of physical security; including leading the industry physical security campaign to further get the message out.

Mrs. Lowey. What role does DOE play with the Department of Homeland Security, utilities, and FERC in protecting the grid?

Secretary Moniz. DOE is leading a significant effort, in coordination with the interagency, DOE National Laboratories, academic institutions, and the private sector, to (1) identify the most critical infrastructure, (2) identify the vulnerabilities and risks to those infrastructures, and (3) identify mitigation measures.

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